

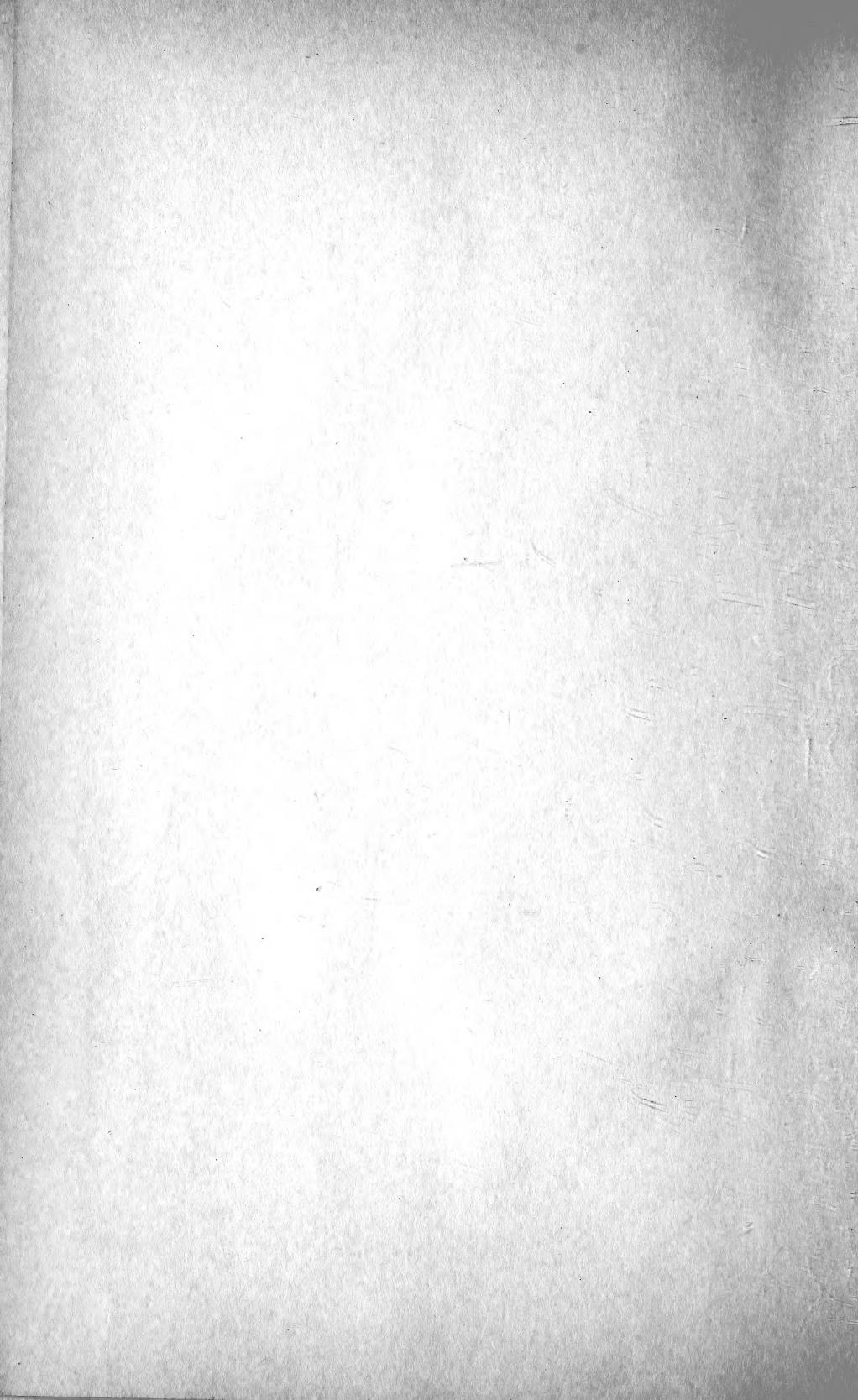
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LORQUINIA

Published by the Lorquin Natural History Club

(Organized—August 1913)

Volume 1. No. 1. Los Angeles, Cal., August 1916. Free to Members

MEMBERS OF THE LORQUIN NATURAL HISTORY CLUB

OFFICERS

Luther Little President. F. Grinnell, Jr. Secretary.
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ACTIVE MEMBERS

(Limited to Twenty)

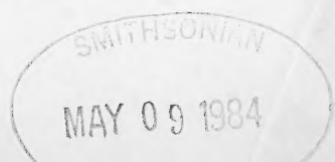
1. Paul Bonnot, General Natural History.
2. Emory P. Chase, Conchology.
3. Alonzo Davis, Entomology.
4. Robert Elwin, General Natural History.
5. F. Grinnell, Jr., Entomology.
6. E. E. Hadley, Geology.
7. Donuil Hillis, General Natural History.
8. Luther Little, Ornithology.
9. Rowland Lyttle, Herpetology.
10. R. D. Moore, Entomology.
11. Raoul M. May, Entomology.
12. George L. Moxley, Botany.
13. Reginald Olds, Entomology.
14. E. G. Osterhoudt, "
15. Stanley F. Patton, Botany.
16. Paul D. R. Rüthling, Herpetology.
17. C. F. Richter, Astronomy.
18. Charles Shattuck, Pigeons.
19. Harold Strawn, Entomology.
20. Harry B. Waller, Geology.

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Frank Alexander. Fordyce Grinnell, Jr. Donald Loughridge.



IN THE SANTA SUSANNA MOUNTAINS

On the morning of June 15th our honored secretary and the writer set out on a tour of exploration in the, to us, hitherto unknown regions of the Santa Susanna mountains. Mr. Grinnell assumed command and enrolled himself as Entomologist of the expedition while the writer took the no less exalted office of Botanist.

Leaving the car at Owensmouth we passed as rapidly as possible through the settled portions of the valley, including the town of Chatsworth, pausing only to note the number of oaks (*Quercus lobata*, Nee.) about Chatsworth, we hastened to the wild and rocky hills north of that place. This region should prove of intense interest to our geologists, who were, unfortunately, not represented in the expedition.

The first ridge was not difficult to conquer, and a little before noon we found ourselves beside a nice stream of water in Devil's Canyon. We had collected a number of plants and here we found a total stranger. It was not, as Mr. Grinnell fondly hoped, an undescribed species, but seems to be *Andibertia nivea*. After some discussion as to which direction to proceed, we went up the canyon a short distance, where we discovered what appeared to be a somewhat easy pass across the ridge into Brown's Canyon, which was our objective point for that day. The pass proved to be quite difficult, but after strenuous climbing and clambering we finally reached Brown's Canyon. Here I want to note that in this pass we saw some of the finest specimens of *Dudleya pulverulenta* (Nutt.) B. & R., that it has ever been my pleasure to come across. Here we saw the only ferns noted in the trip.

After reaching Brown's Canyon we rested awhile, as we were pretty tired, then went up the canyon in search of a camping place for the night. We found a very pleasant grove of live oaks with a grassy space, where we spread our blankets and turned in rather early. It wasn't as restful as my own bed at home, but we managed to sleep, and early in the morning were up preparing to climb to the summit of the Santa Susanna ridge. This climb was not as strenuous as the one of the previous day, and before nine o'clock we were at our objective point, a fine clump of *Quercus lobata* that shows plainly on the sky-line from many points in the valley. Descending to our camp we came down the canyon to Chatsworth, where we separated, Mr. Grinnell continuing his explorations and the writer returning home.

While we did not collect any ferns, we noticed the following :
Cheilanthes californica (Nutt.) Mett. *P. ornithopus* Hook.
Pellaea andromedaefolia (Kaulf.) Fee.

A list of the plants collected follows. Two grasses and a sedge will be turned over to our agrostologist, Mr. Patton, for determination:

<i>Pseudotsuga macrocarpa</i> (Torr.) Mayr.	<i>Quercus obt</i> Nee.
<i>Heteromeles arbutifolia</i> (Poir.) Roem.	<i>Q. Chrysolepis</i> Liebm
<i>Cercocarpus betuloides</i> Nutt.	<i>Lupinus formosus</i> Greene.
<i>Zauschneria californica</i> Presl.	<i>Silene lacinata</i> Cay.
<i>Chorizanthe staticoides</i> Benth.	<i>Astragalus antiselli</i> Gray.
<i>Godetia viminea</i> Spach.	<i>Rhus laurina</i> Nutt.
<i>Convolvulus occidentalis</i> Gray.	<i>Audibertia nivea</i> Benth.
<i>Gilia gilioides</i> (Benth.) Greene.	<i>A. stachyoides</i> Benth.
<i>G. virgata</i> Stend.	<i>A. polystachya</i> Benth
<i>Navarretia atractyloides</i> (Benth.) H. & A.	<i>Helianthus gracilentus</i> Gray.
<i>Solanum Xanti intermedium</i> . Parish.	<i>Deinandra fasciculata</i> Greene.
<i>Symphoricarpuis mollis</i> Nutt.	<i>Emenanthe penduliflora</i>
<i>Phacelia grandiflora</i> (Benth.) Gray.	<i>Erigeron fragilis</i> Greene.
<i>Leptodactylon californicum</i> H. & A.	<i>Perezia microcephala</i> Gray.
<i>Grindelia camporum</i> Greene.	

GEORGE L. MOXLEY,
Los Angeles, Cal.

EXTRACTS FROM E. E. HADLEY'S ADDRESS

(The entire address is incorporated into the minutes of the May, 1916, meeting of the Lorquin Natural History Club.)

There are many societies and clubs which are devoted to some one branch of natural science, of which the members are interested in some one line. These organizations are very helpful to those who attend them.

An organization such as the Lorquin Natural History Club, I believe, is the ideal, being, as it is, open to all branches of natural history, thus giving each member a wider field and a broader view of the works of nature than he would have were he only to meet with those who are pursuing the same branch in which he himself is especially interested.

The true naturalist is not limited to any one branch of nature-study. Though he may make a specialty of some particular branch, if he follows it closely and persistently, he will find that he must inform himself on some other line closely connected with it in order that he may better understand the one of his first choice.

In all scientific research, while specialization in some one line is to be encouraged, and is indeed necessary, in order to reach a point where ones work is of real value, yet we should build on a broad foundation, by acquiring a good general knowledge of scientific subjects, for by so doing we are better able to wrestle with the problems we are sure to meet.

Having our organization thoroughly under way and all working harmoniously it is but natural that new ideas will be thought out and new problems solved.

Some have already beheld, in the more or less distant future, a club house in some quiet, restful place, away from the noise and bustle of the city and close to the heart of nature, where members may retire on holidays and vacations for rest and recreation, that one must have occasionally if he would retain his full powers of body and mind. Such an acquisition is a thing much to be desired, and, let us hope, not beyond the range of possibilities.

A library would be a valuable possession for the club. This would not necessitate any great outlay of expense. Some of the best scientific literature, such as government and state reports and other publications, are for free distribution. University publications and those from some of the larger museums are very helpful and should be accessible to everyone who is engaged in the study of any branch of natural history.

A museum would add materially to the interest of the club. Each member, collecting in his own special line, could co-operate in accumulating a great mass of valuable material. It would be possible to have a collection such as one of the larger museums would be glad to possess. Should a museum be started, all the members would be on the lookout for specimens and it would stimulate activity in all branches represented by the different members.

Arrangements could be made for lectures on special subjects in some branch of natural history. Such lectures, of course, should be held outside of the regular meetings and in some public meeting place or auditorium open to the public.

A club publication is another of the possibilities which we might do well to consider.

No one understands or realizes the importance of the law of evolution better than the naturalist, and we can apply the same law to the growth and development of our club, as we see it has been applied by nature herself in the development of all life. But let this evolution be always in advance and never a retrograde, as has been the case in some types of animal life, as, for example, some of the marine mammals who have forsaken the land and taken to deep water, thereby descending in the scale of life. Our development can be ever in advance, continually bringing forth new ideals and striving to attain them.

BUTTERFLY RECORDS

On June 27, 1916, on a trip up to Alpine Tavern, Mt. Lowe, by way of the Sunset trail, and along the ridge to the eastward and back by way of Camp Sierra, I saw or took the following butterflies and moths:

Thecla spadix (rare and local), *Thecla saepium* (fresh) *Thecla grunus* (just out and common around the golden oaks), *Thecla dryope* or *californica*, *Lycaena enoptes*, *acmon* and *marina*, *Melitaea chalcedon* (common), and *wrighti* (rare), *Papilio eurymedon* (on a peak, as is the usual thing for this butterfly), *Heterochroa californica* (around the golden oaks), *Thanaos* Sp., and the nice little noctuid moth *Stylopoda anxia*, *Argynnis semiramis*, *Lycaema*, *piasus* and *Pamphila nemorum*.

Thecla balesus, Hubner—Fred King took a specimen in the Highland Park hills last spring, and on July 11th, on a trip with Alonzo Davis in the upper Arroyo Seco Canyon, a specimen was found among some boulders, just emerged and beautifully fresh. This beautiful butterfly has been taken rarely at several localities in Southern California and seems to be uncommon.

Argynnis callippe (Boisduval)—Fred King has taken this the past two seasons in the Highland Park hills.

FORDYCE GRINNELL, JR.

COLLECTING TRIP TO VERDUGO PEAK (NEAR GLENDALE, CALIF.)

The sun shone and the weather was summery on Sunday, February 6, 1916, the first warm day after a long period of cold and rain of the preceding winter.

Shortly after daybreak Robert Elwin, R. Lyttle, Paul Rüthling and Ledyard Leech met in Glendale, a small town about ten miles from the city of Los Angeles. Before the day became very warm, they ascended Verdugo Peak, altitude about 4000 feet. On the way back they climbed down a side canyon that runs toward the La Canada Valley, and by way of Verdugo Canyon returned to Glendale.

In the early morning nothing beside some tree toads and one toad was caught. After leaving the peak many wood rat nests were observed built near the bottom of small canyons. A large rat ran out of one of these that was torn open among the brush on the mountain side. Down the steep slope the collectors rolled a large stone that was under the nest and discovered, where the stone had been, a skink and a good sized Footless Lizard.

At the mouth of the canyon, when they had reached the valley floor, they found a group of oak trees far out in the open grape field. Among the stones at the foot of these trees and within about ten feet of each other were caught, under the first stone lifted, a young Pacific Bull Snake and a Footless Lizard, and among other stones, Brown-shouldered Swifts, Fence Lizards and one Alligator Lizard.

Tree toads were heard singing and some eggs were found in shallow pools in Verdugo Canyon.

The catch of the trip included every species of lizard known to exist in the vicinity of Los Angeles except Stejneger's Whip-tailed Lizard and the Horned Lizard and also included the first snake seen in the field by any member of the club this year. The total catch was as follows:

- 7 Fence Lizards, *Sceloporus biseriatus*, [more were seen.]
- 3 Brown-shouldered Swifts, *Uta stansburiana*, [more were seen.]
- 2 Alligator Lizards, *Gerrhonotus scincicauda*, [one was very young.]
- 2 Footless Lizards, *Anniella pulchra*, [in earth under stones.]
- 1 Skink, *Eumeces*.
- 1 Pacific Bull Snake, *Pituophis catenifer*, [about twenty inches long.]
- 5 Toads, *Bufo halophilus*.
- 6 Tree-toads, *Hyla regilla*.
- 5 Salamanders, *Batrachoseps attenuatus*, [some large and some small.]
- 6 Millipedes, a large species [unidentified.]
- Many scorpions and about five species of centipedes were set free after examination.

PAUL D. RÜTHLING.

PALAEONTOLOGICAL RESOURCES OF LOS ANGELES COUNTY

Perhaps there is no section of the country where there is more of interest to the geologist and palaeontologist than can be found within a few miles of Los Angeles. The folding and upturning of the strata and the deep erosions expose to view many thousands of feet of the earth's crust. This, with the deep borings of oil wells, furnish an opportunity for studying, literally, miles of thickness of strata from the later through the whole of the Tertiary and Pleistocene.

In palaeontological research no region in the world can boast of richer finds than that of the famous La Brea beds, that have furnished a fauna that is indeed a revelation to science. Aside from the work done in the La Brea fields, comparatively little has been done of research in the line of palaeontology. This leaves a large, and no doubt, rich field practically unexplored, while it is not probable that there is anything in this region that will compare in real value and wealth of material with that of the La Brea beds, yet no doubt a systematic exploration of the Tertiary and Pleistocene of this region would furnish material that would greatly enrich our museums and throw much light on the conditions existing during those periods.

E. E. HADLEY, Alhambra, Calif.

ANNOUNCEMENTS

REGULAR MEETING—Friday evening, Seprember 1, 1916, at the home of Robert Elwin, 946 Beacon Street. For active members.

SPECIAL MEETING—Tuesday evening, September 5, 1916, at 8:00 o'clock, in the lecture-room of the Public Library, tenth floor of the Metropolitan Building. For associate members and others.

FIELD TRIPS—Sunday, August 27, 1916, in the Boyle Heights hills, at the end of East First Street car line. Led by Harry B. Waller.

LORQUINIA

GEOLOGIC NOTES

In a fossiliferous locality, on Hanging Rock Hill, between Ca-huenga Mt. and Mt. Hollywood, there is a stratum of fine, even grained, grey sandstone, rich in the fossil remains of *Docinia*, *Ostrea*, *Pecten*, *Cardium* and *Pelecypoda*, but poor in the remains of Gasteropoda, only one specimen being found in an afternoon's collecting, a mold of *Pleurotoma*, which answers to the description given by Dr. Ralph Arnold to a new species found by him in the Coalinga district and named *P. Coalingensis*. It is probably a lower Upper Miocene species.

HARRY B. WALLER.

LORQUINIA

Lorquinia is to be issued monthly and will be sent free to active and associate members of the Lorquin Natural History Club. It is to be a bulletin of the observations of the members of the club, which represents all the larger branches of natural history.

In the next issue will be commenced advertising, to consist of liners for wants and exchanges and advertisements of reliable concerns. As Lorquinia is being introduced in all parts of the United States in the leading museums and scientific institutions, this will offer collectors an excellent opportunity for beginning or enlarging their collections through the use of the exchange column. Want or exchange advertisements will be charged for at the rate of 1½ cents a word, minimum charge 25 cents. Cash must accompany advertisements, which should be addressed to

ADVERTISING MANAGER, LORQUINIA,
1051 West Twenty-third Street,
Los Angeles, California.

LORQUINIA

Published by the Lorquin Natural History Club

(Organized—August 1913)

Volume 1. No. 2. Los Angeles, Cal., September 1916. Free to Members

EGG-CASES OF SOME LOCAL MOLLUSCA

While collecting mollusca at the government breakwater at San Pedro on June 19th a few small egg-cases were found, one of which contained young shells. On examination with a strong lens these were seen to be the young of *Fusinus luteopictus*, Dall. (the painted spindle shell). A description may be of interest.

The egg-cases were composed of a rather tough, transparent substance, reminding one of thin celluloid. They were somewhat triangular in shape and quite flat, and were attached to the under side of rough rocks by a short stiff stem. All those seen were uniform in size, about 5 mm. wide and 5 mm. high, including the stem. Those which contained eggs were about 1 mm. thick, and the one containing small shells was somewhat thicker. The undeveloped eggs were pink in color and very minute.

The shells taken from the egg-case are nearly globular in shape and about 1 mm. high. They are composed of two turns or whorls, the first or nuclear, is very small, yellow and smooth; on the second there are axial ribs, at first low and weak, but well developed on the last half turn, where five spiral ridges appear, making the surface reticulate. This whorl is light brown in color. The aperture is nearly round, extending to a short broad canal below; outer lip wavy, columella straight, no umbilicus. In mature specimens the columella is longer in proportion and somewhat revolute and the canal is longer and narrower. There were seven young shells in this egg-case and they filled it more than half full. I believe that they would have burst the case soon and escaped, some to grow to maturity and others probably to become the food of fishes or crabs or possibly to be carried away from the rocks by the tide and dropped on some mud bank to smother in the soft silt.

On July 19th, while collecting along the rocky coast south of Balboa, I gathered another lot of small egg-cases. These contained a single young shell each and on examination proved to be the young of

Macron Lividus, A. Ad. Some of the shells were developed, filling the cases quite full, so I feel certain they would soon have broken out.

These cases were similar in substance to those described above and were oval in shape, about 5 mm. in height by 3½ mm. wide and the ones containing shells were quite thick. The shells taken from these egg-cases are 2 to 3 mm. tall and are the same shape as the mature shell. They are composed of two whorls, the first or nuclear is nearly white and shows a few revolving striae; the second is covered with a very thin light brown epidermis and shows about 18 revolving striae between the suture and the closed umbilicus; these striae are crossed by numerous very fine growth lines.

In both the above instances the egg-cases were found singly. This is quite different from the habit of some other mollusca, *Tritonalia poulsoni* and *Purpura nuttallii* depositing their egg-cases in large groups. I have seen four or five specimens of *Tritonalia poulsoni* depositing their egg-cases in one large group, covering a space of three or four inches in diameter.

E. P. CHACE.

A RARE CAT-TAIL

I have recently come upon a number of specimens of *Typha angustifolia*, the narrow-leaved cat-tail. This species is noted by Professor Abrams, in his Flora of Los Angeles and vicinity, as being found in places similar to those in which *T. latifolia*, the broad-leaved or common cat-tail grows, but he notes it as "not common." *T. angustifolia* differs from *T. latifolia* in having narrower leaves and a longer and narrower spike, which constitutes the "tail." This spike consists of a great number of small flowers, of which the upper contain stamens but no pistils, while the lower contain only pistils. In *T. latifolia* the parts of the spike which contain these two kinds of flowers are usually not separate, but intergrade, while in *T. angustifolia* there is a gap in the spike, dividing it into two distinct segments.

The specimens referred to above were found along the Arroyo Sacatella (a marshy creek) about fifty feet south of Wilshire Boulevard, opposite Normandie Avenue, in Los Angeles.

CHARLES F. RICHTER.
Los Angeles, Cal.

INSECT COLLECTING IN THE SAN BERNARDINO RANGE

Of all the good collecting places for insects in or near the city of Los Angeles, the best, to my mind, is the San Bernardino range of mountains, which is the most conspicuous feature of San Bernardino county. I had the pleasure to spend the first two weeks of July in one of the camps of that range at an altitude of 4500 feet.

The soft, balmy air, the running clear streams, the numerous trees and bushes, the grass and flowers, together with the absence of any of man's work all combine to make those mountains a paradise for insects. Wherever you go or whatever you do, you are always made aware of the thousands of small creatures, either by their song or by their presence. Not having yet classified the insects I caught there I must satisfy myself by giving the popular names, or as well as I can, a few generalized Latin names.

Beetles form the majority of species there. I observed many species of June beetles, the giant wood borers, together with many other Cerambycidae, a few tiger beetles, (Cicindelidae), water beetles, both predacious and scavenger, rove beetles, click beetles (Elateridae), fireflies and many kinds of Scarabaeid beetles. There were many butterflies, with the Buck-eyes and Lorquin's Admirals leading for numbers. Of the two winged flies there were only too many mosquitos, black flies, big robber flies, bee flies, flower flies and the ever present muscids.

There were many kinds of locusts and grasshoppers, many of which were very pretty. I also got one immature mantid, Stone flies were common, and you could see hundreds of empty larval skins on the stones near the water. Ant lions, lace wings, Raphidia or rubber-necks, May flies and different species of dragon flies were present, while in the evening the air was full of flying termites.

The true bugs were well represented, the songs of the cicadas being a real comfort in the middle of the soundless solitudes.

Finally, the number of Hymenoptera was very great. I observed about fifteen species of wasps, both the true wasps and the digger wasps. Ants of many kinds ran here and there, and many species of both solitary and social bees were seen and taken.

The collecting trip was thus a very fruitful one in this grand and truly wide range that the writer would recommend to all insect lovers.

RAOUL M. MAY,
Los Angeles, Cal.

THE LORQUIN NATURAL HISTORY CLUB

In June of 1913 a small notice inserted by F. Grinnell, Jr., in a Los Angeles daily newspaper, stated that a meeting of boys interested in natural history was to be held in the home of Harold Strawn, of this city, and that all boys interested in natural history were welcome to attend.

Two of the present active members, Harold Strawn and Fordyce Grinnell, Jr., were there on the designated evening, when the third—at the time a stranger—dropped in and introduced himself as Paul Rüthling, fond of snakes. It is to be doubted if, since that evening, one of these has missed more than three of the club meetings during the club's growth.

It was at about this time that Mr. Grinnell also organized a similar meeting in the home of Rutherford Moore, but it was not until the first Friday in July, 1913, that a constitution committee was appointed. At the August meeting this committee, consisting of Ralph Church, Rutherford D. Moore and Paul Rüthling, submitted a constitution, which, with minor changes, was adopted by a group of ten boys, who elected officers and proceeded to be known thenceforth under the name of Lorquin Natural History Club, limited to twenty active members.

From that time on meetings have been held regularly on the first Friday of every month, when some authority known to Mr. Grinnell or some other member, would address the club on the particular branch of Natural History in which the speaker was interested. Then, as now, the meetings were held in the homes of different members, but were usually the scenes of boyish disorder and "rough-housing." The club managed to pass through the first year of its existence without any extensive damage to furniture in the places of meeting.

In 1914 Rutherford Moore, President, represented the club at the opening of the Southwest Museum, Los Angeles, where the curator spoke of giving the club a room in the building. As Rutherford Moore had not seen the room and could not say anything definite about the Museum's plans, our Secretary, James Cuzner, entered the following in the club minutes for January: "Rutherford Moore gave a description of the Southwest Museum."

During the years of 1913 and 1914 many of the less interested of the club members were dropped from the rolls of the club, generally because of irregular attendance. New members filled their places until now in 1916, when, for the first time, there are no vacancies among the active members.

The club activities began in a small way. The first thing of any importance was the adoption of a club photograph album, in which photographic records of the various activities of the club members are entered. There are now several very interesting series of pictures taken by different members and some ought in the future to furnish fine photographic material for Lorquinia.

In 1914 our conchologist, E. P. Chace, who was then a new member, introduced the idea of having club stationery. It was felt that this was a necessity for many of the members who were constantly exchanging, so there was little time lost in obtaining the stationery. Several members, interested in the Southwest Museum, a young and thriving institution, thought that the use of the Museum name on club stationery would call to the attention of correspondents the existence of a museum that was heretofore unknown to many. In return for this Dr. Alliot, the Curator, very kindly agreed with one of the members to permit the club to use the name of the museum on its stationery as a permanent address, to which any correspondence could be directed.

Soon after, the club took up the matter of club pins, and the design of a four-petaled poppy was chosen with the club initials—L. N. H. and C.—one letter being on each petal.

In 1916 Donuil Hillis, one of the charter members, suggested the printing of signs warning people not to kill harmless snakes, on account of the great benefit they prove themselves in the destruction of rodents, some of which are disease-bearing and dangerous. This suggestion found ready support from the herpetologists of the club and also from the members interested in other lines. Therefore, when the warm rays of the summer sun brought the Californian snakes from their winter hibernating quarters there were posted in mountains, valleys and canyons signs that read as follows:

DO NOT KILL HARMLESS SNAKES?

They are useful in destroying disease-bearing rodents.

The only harmful snake in California is the Rattlesnake.

LORQUIN NATURAL HISTORY CLUB, LOS ANGELES.

On some of these signs is painted the altitude at which the signs are posted. On the original sign, of which the rest were to have been duplicates, the name "Southwest Museum" was given as an address. Inadvertently this was omitted in all the signs posted.

At the May meeting of the club, during the present year, the

question of a publication was first openly mentioned by E. E. Hadley. At the July meeting a publication committee was appointed, pending certain constitutional amendments. The publication committee took things in its own hands and decided to issue the first number of Lorquinia in August, 1916, to commemorate the third birthday of the club. At the August meeting the club voted the necessary appropriation and the publication was already prepared to go to press. Lorquinia made its first appearance a day before it was due, the following week.

The Lorquin Natural History Club is now composed of twenty active members and an unlimited number of associate members. There are special meetings for the associate members, who meet once a month in the lecture room of the Los Angeles Public Library, where they hear instructive lectures by specialists in various lines and receive help from each other in collecting and classifying various specimens. Field trips will be arranged often.

Regular meetings are still held on the first Friday evening of each month at the homes of members and friends of the club. It is at the regular meetings that the active members manage the business and affairs of the club. A limited number of associate members that apply beforehand to the Secretary or some other active member are given invitations to attend the regular meetings, so they may keep in touch with the internal operation of the club business and aid with suggestions and advice.

Among the active members there are now left only four of the original charter members. Many of the present members have joined during the last year and include in their lines some of the best specialists that may be found in Southern California. The extraordinary activity and growth of the Lorquin Natural History Clnb is due to the enthusiasm, co-operation and loyalty of the active members, who, by process of elimination, now form the nucleus of a "Greater" Lorquin Natural History Club. Truly, "The old order changeth, giving place to new."

DESERT REPTILES

During June of this year, on an automobile trip through some remote parts of the great Colorado Desert, R. Lyttle collected some beautiful and interesting desert lizards, which he brought alive to Los Angeles. The following comprised the catch:

One Clark's Swift, *Sceloporus clarkii* (Baird & Girard). Found

fallen in the bottom of a ninety foot well at an altitude of about 3000 feet in a range of mountains about 20 miles south of Yucca, Arizona.

One Collared Lizard, *Crotaphytus collaris*, (Tay). Noosed with fish-line near watering trough beside road at an altitude of about 4000 feet in a range of mountains about 20 miles south of Yucca, Arizona.

One Zebra-tailed Lizard, *Callisaurus draconoides*, (Blainville). Noosed at an altitude of about 2000 feet in a range of mountains about 20 miles south of Yucca, Arizona.

One Desert Tortoise, *Testudo agassizii*, (Cooper). Caught in road in California about 10 miles west of Needles.

One of each of the above species was all that was brought back by Lyttle because he spent most of the four days of the trip in driving or snatching a few hours sleep at night. Among the rocks on the California side of the Colorado river, opposite Topac, Arizona, Lyttle saw a Chuckawalla, *Sauromalus ater*, (Dumeril), but was not spry enough to capture the elusive reptile, which darted through hidden channels among the stones and escaped to parts unknown. One other Desert Tortoise seen on the trip was unintentionally run over and mashed by the automobile in a desert road.

On the entire trip only one snake was seen. This individual, with typical desert rapidity, did not pause for even a brief introduction, but departed in such haste that his identity was not established.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

REGULAR MEETING—Friday evening, October 6, 1916, at the home of Charles F. Richter, at 7:00 o'clock. Address, 801 South Kingsley Drive, Los Angeles. For active members, Prof. Melville Dozier will speak with the planetarium and Charles Richter will demonstrate his three-inch telescope.

SPECIAL MEETING—Tuesday evening, October 3, 1916, at 7:45 o'clock, in the lecture-room of the Public Library, tenth floor of the Metropolitan Building. For members and those invited by them. There will be an illustrated talk on "The Life of the Butterfly," exhibitions of specimens of different kinds and short contributions by members.

FIELD TRIPS—Saturday, October 7, 1916, in Elysian Park. Meet at the North Broadway entrance at 8:00 o'clock. For all who wish to attend. Led by F. Grinnell, Jr. Bring lunch.

Sunday, October 8, 1916, in Hollywood mountains. Meet at end of Hollywood car line that runs to Laurel Canyon, at 8:00 a. m. Trip will be led by Paul Rüthling and will leave at 8:15. Members may invite friends. Bring lunch.

At the September regular meeting a motion was passed to discontinue the use of the Southwest Museum as a club address. In the future all correspondence may be addressed "care of Lorquinia, 1051 West Twenty-third Street, Los Angeles," or to individual members, until some future time, when the club may have a city home of its own.

NOTES AND NOTICES

The sixty-first regular meeting of the Pacific Entomological Society was held on Saturday evening, August 26, 1916, in the board room of the Mechanics Institute in San Francisco.

On the evening of Thursday, August 24th, the active members of the Lorquin Natural History Club held a special meeting at 1051 West Twenty-third Street to discuss future plans for the club.

The Lorquin Natural History Club gratefully acknowledges the receipt of congratulations and wishes for success in the issuance of *Lorquinia*. It extends its thanks to Mrs. M. Burton Williamson, the San Diego Society of Natural History, Guy L. Cuzner, Robert Leroy Beardsley and Joseph Grinnell of U. C.

Dr. C. L. Edwards, of the Los Angeles Public Schools, was recently elected a member of the California Academy of Sciences. His chief biologic interests lie in the study of marine forms of animal life.

Donuil Hillis has been appointed Advertising Manager of *Lorquinia*. Direct your liners to him.

FOR SALE, WANTS AND EXCHANGES

If you know an active collector who wishes to exchange, purchase or sell specimens you will do him a favor by calling his attention to the *Lorquinia* Want and Exchange column, where he may advertise his wants at the rate of 1½ cents a word, minimum charge 25 cents.

FOSSILS FOR EXCHANGE—Carboniferous and Tertiary. Send for list. E. E. HADLEY, 123 So. First Street, Alhambra, Cal.

FOR EXCHANGE—California shells for others. Special habitat notes if requested. First class specimens only. Send your list if interested. E. P. CHACE, 7629 Walnut Drive, Los Angeles, Cal.

RAOUL MAY, 2202 West Tenth St., Los Angeles, Cal., exchanges any insects except lepidoptera. Wants mostly Hymenoptera.

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LORQUINIA

Published by the Lorquin Natural History Club

(Organized—August 1913)

Volume 1. No. 3. Los Angeles, Cal., October 1916. Free to Members

THE STUDY OF VARIATION

The problem of the evolution of living things is one of variation, the differences and resemblances between organisms and their parts. There are no two living things or parts of these which are alike. The reason for this variability has no explanation, except that it seems to be an inherent quality of all living things. But we know that these variations may be of some use to the possessor and that the fixation of the aggregate of these variations constitutes what we call a species or kind. We can see this going on in all stages and all around us. Some species seem to be stationary as regards variability, more or less, and others extremely variable in all directions, while still others are in intermediate stages of change. The tendency to vary, and consequent selection of certain variations to form a species seem to result from the kind of environment or isolation of a certain group of individuals.

There is already a large amount of published information on the subject of variation, but we really know too little about the commonest living things around us, their behavior and variability together with the conditions and locality in which they live. Time is an important factor to consider—for living things have been growing, varying and evolving for ages of time—but, nevertheless, we can get a little idea in the short time we have to observe the processes of life, and maybe, after a few generations of such observations, a grain of truth. “Time is as long as space is wide.” As Huxley said: “In relation to the human mind, nature is boundless; and, though nowhere inaccessible, she is everywhere unfathomable.” That is true and always will be so. So, let us observe carefully the things around us and put on record our observations.

PYRAMEIS GARYAE, VARIETY MUELLERI (LETCHER)

This peculiar form of one of our commonest west coast butterflies was named and described and subsequently listed as an aberration. Its

peculiar and striking departure from the normal is well shown in the plate published by the late Beverly Letcher in Entomological News, IX, page 38, plate 1898, and is enough to suggest an aberration or sport; but its rather frequent occurrence and capture in the same haunts as typical *caryae* suggests that it is another form of variation of more significance to students of evolution, but what kind of variation is hardly guessed at as yet. It is not a seasonal form, as suggested by Letcher and other collectors, as it is taken at different times through the year.

I have seven specimens taken during 1915 by different boys about Los Angeles, and they are alike in general. In one specimen the row of white spots on the hind wing is very well marked and with wide, black, heavy rings; while in another these white spots are much smaller and with no black rings. The other specimens are intermediate but incline towards the latter form in appearance.

Muelleri is more variable than typical *caryae*, but it varies within comparatively well defined limits. This variation will be worth watching in the future.

FORDYCE GRINNELL, JR.,
Pasadena, Cal.

THE GENUS QUERCUS IN CALIFORNIA

There are approximately 300 species of the genus *Quercus* distributed in various parts of the world, not including the many hybrids and horticultural varieties. Of this number about 53 are indigenous to the United States, and of these nature has favored California with nearly one-third. The following is a brief list of the representatives found in California:

QUERCUS LOBATA, Nee (Valley Oak). This is perhaps the largest of our California oaks, sometimes reaching a height of one hundred feet or more. This species may be found growing in rich loamy soil, but is smaller out of the valleys in poorer soils. It occurs most frequently in the interior plains and valleys of the coast ranges—Tehachepi Valley, Antelope Valley, etc., its southernmost limits seeming to be Santa Monica and Lamanda Park. It is abundant in the Sacramento Valley and widely distributed in Northern California.

QUERCUS BREWERI, Engelmann. (Brewer Oak or Shin Oak). This low growing oak is found on mountain slopes in dry gravelly soils among low chaparral brush. It is found in extensive thickets on the upper San Joaquin River at about 6000 feet altitude. It is also found in the Kaweah River Valleys.

QUERCUS ARRYANA, Hooker. (Garry Oak). The Garry oak is found in Northern California in valleys and on prairies in deep humus soils. It is not common on dry hill and mountain slopes, usually being small and scrubby when found in dry gravelly and rocky soils. It occurs frequently with *Quercus morehus*, Kellogg; Douglas Fir (*Pseudotsuga taxifolia*, Poir.) Britt. Madronas (*Arbutus menziesii*, Pursh.) and Western Yellow Pine (*Pinus ponderosa*, Lawson). The species extends through Oregon and Washington to British Columbia, where it becomes a larger tree.

QUERCUS SADLERIANA, (R. Brown) Campst. There appears to be no common name for this species except Scrub Oak, as it does not exceed six feet in height. It occurs on high dry slopes at about 8000 feet in altitude in Del Norte County, where it produces very dense thickets.

QUERCUS DOUGLASII, Hooker and Arnott. (Blue Oak). Very appropriately is this tree called Blue Oak on account of the blueish green color of its foliage. This oak is also known as white oak, because of the gray appearance of its bark. The mature leaves and acorns are very variable, the latter being produced in one season. This oak occurs very extensively in various parts of California on low foothills and in valleys in dry gravelly and rocky soils, usually growing with Post Oaks, the California Live Oak and the Sabine Pine (*Pinus sabiniana*, Douglas.)

QUERCUS ALVORDIANA, Eastwood. (Alvord's Oak). This is a comparatively newly found species, occurring on hills near the desert in Southern California. A small shrub with very brittle leaves, being broken very easily upon being touched. It is probably closely related to *Quercus dumosa*, Nuttall.

QUERCUS DUMOSA, Nuttall. (California Scrub Oak). This oak varies more than any other species, with the possible exception of *Quercus undulata*, Torrey, of the Rocky Mountains. Several varieties have been singled out by different botanists, but they are hopelessly confused. The species occurs on low mountains and foothills from Central to Lower California. It tolerates the poorest and driest gravelly soils and, in many instances, may be found growing in crevices of rocks.

QUERCUS ENGELMANNI, Greene. (Engelmann Oak). It is also called Evergreen White Oak, although not strictly an evergreen species. It occurs in low, dry, sandy and gravelly soils in Southern California from Altadena to Glendora and southward to Lower California, and is found in small groups, usually with California Live Oaks.

QUERCUS CHRYSOLEPIS, Liebmamn. (Canyon Live Oak). This is an evergreen oak that is very variable in size and form, being found varying in size from low dense brush to a large tree forty feet high. It is usually found in dry sandy and gravelly soils, the larger trees being found in rich humus soils, usually growing among the Black Oak, California Live Oak, Western Yellow Pine and Incense Cedar (*Librocedrus decurrens*, Torrey). Two distinct varieties have been described, *Quercus chrysolepis palmeri*, Engelmann, found in extreme Southern California, and *Quercus chrysolepis vaccinifolia* (Kellogg) Engelmann, or Huckleberry Oak, a low shrub growing in high altitudes in the Trinity Mountains.

QUERCUS TOMENTELLA, Engelmann. There seems to be no field name for this little known species. It grows about forty feet high and is usually found in canyon bottoms and on exposed slopes in gravelly soils at Santa Rosa, Santa Cruz and on Santa Catalina, San Clemente and Guadalupe Islands.

QUERCUS AGRIFOLIA, Née. (California Live Oak or Holly-leaved Oak). It is the commonest and best known of our native oaks and is usually found growing in the open, where it reaches a height of from twenty-five to seventy-five feet. It occurs on low hills, in open valleys, shallow canyons and sometimes near the seashore, where it is very stunted. It forms open forests and may also be found growing with Valley Oak, Blue Oak and Post Oak.

QUERCUS WISLIZENI, A. de Candolle. (Post Oak). This species is also called Live Oak, but it is an entirely different species from the preceding, although resembling it in size, general form and appearance. It is usually found on foothill slopes, open valleys and dry river bottoms in poor gravelly soils. It is larger in sheltered locations. It is found with the Scrub Oak and chaparral.

QUERCUS MOREHUS, Kellogg. (Morehus Oak). This rare and little known oak is said by some authors to be an hybrid between *Quercus wislizeni* and *Quercus californica*. It occurs in Central and Northern California on slopes and ridges in gravelly soils, but is not abundant. It is found often with California Black Oak, Post Oak and *Fremontodendron californicum*.

QUERCUS CALIFORNICA, (Torr.) Cooper. (California Black Oak). Differing greatly from all other Pacific oaks, it attains an height of seventy-five feet, but at high elevations it is much smaller, often under twelve feet. It is found in Southern California but is very common in the northern part of the state on mountain slopes, valleys, canyon bottoms and places characterized by dry gravelly soils and rocky surroundings where there is practically no soil. It is usually found mingling with California Laurel (*Umbellularia californica*, (Hooker and Arnott, Nuttall), Western Dogwood (*Cornus nutallii*, Audubon) and Canyon Live Oak. It is usually largest in sheltered locations.

QUERCUS DENSIFLORA, Hooker and Arnott. (Tanbark Oak). Of extensive use in the tanning processes, this tree has a smooth trunk and reaches a height of about eighty-five feet, but becomes very stunted at high elevations. It occurs from Oregon to Southern California on borders of mountain and foothill streams and revines in rich sandy and gravelly soils, and usually mingles with the California Redwood (*Sequoia sempervirens*, Endlicher) and Douglas Fir. In 1866 Oersted called this oak *Pasainia densiflora*. The characters of its inflorescence distinguishes it as being the connecting link between the oaks (*Quercus*), and the chestnuts (*Castanea*). There is a variety of this species, *Quercus densiflora ecbinoides*, (R. Brown) Campst.

CECIL HART,
Montebello, Cal.

BUTTERFLY COLLECTING IN PLACERITA CANYON, CALIFORNIA

On September 12, 1916, I went to Placerita Canyon, the road to which branches off from the main highway between Newhall and Saugus.

I captured the following species: *Pyrgus ericetorum*, *Lemonias virgulti*, a *Coenonympha*, *Pamphila columbia* and nearly succeeded in capturing a second *ericetorum*. This Pyrgus seems to be very common in both Placerita and Bouquet Canyons, but is exceedingly wary and swift of flight. I noticed at least a half dozen flying through the canyon but succeeded in capturing only the one.

Earlier in the season I captured *Colias barbara*, *Thecla dryope* or *californica*—a very large and light specimen—*Lycaena batoides* and *Melitaea chalcedon*.

Three specimens of *Argynnis callippe* were taken by me in Bouquet Canyon, where several more were observed as well as *Pyrgus ericetorum* and *Meganostoma eurydice*.

In the hills near the Newhall tunnell I have taken *Thecla halesus* as well as many specimens of *Nisoniades*, *Pamphila* and *Satyrus*. *Lycaena acmon* may be seen there in countless numbers flying around a shrub that bears brownish-white bunches of blossoms. This whole vicinity seems to be a most fruitful hunting ground.

GEORGE E. MALCOLM,
Los Angeles, Cal.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

REGULAR MEETING—Friday evening, November 3, 1916, at 7:00 o'clock, at the residence of Mr. Wm. A. Spalding, 134 North Gates Street, Los Angeles. Take North Broadway car. For active members. Mr. Spalding will talk on electricity.

SPECIAL MEETING—Tuesday evening, November 7, 1916, at 7:45 o'clock, in the Lecture Room of the Public Library, tenth floor of the Metropolitan Building. For members and those invited by them. Dr. Charles Lincoln Edwards will lecture on "A Naturalist in the Bahamas."

FIELD TRIP—Saturday, November 11, 1916, at the end of the West Adams street car line (through car), at 8:00 o'clock. For all interested. Bring lunch. Led by F. Grinnell, Jr. The interrelations of plants and animals will be the study aim of these field excursions.

The membership Committee announces that it has accepted the following applications for associate membership and wishes to thank the new members for their donations: William A. Streeter, 749 West 94th Street, Los Angeles, Cal.; Cecil Hart, R. F. D. 6, Box 432, Montebello, Cal.; Dr. Norman Bridge, Security Building, Los Angeles, Cal.; George B. Culver, 1752 Garfield Place, Hollywood, Los Angeles, Cal.; California Society of Sons of the Revolution, 621 Citizens National Bank Building, Los Angeles, Cal.; Jose M. Ferreira, Box 201, Calexico, Cal.; Prof. Herman L. Fairchild, University of Rochester, New York; Adelbert F. Howland, 2252 Hobart Boulevard, Los Angeles, Cal.; Dr. Joseph Grinnell, Mus. of Vert. Zool., Berkeley, Cal.; Augusta C. Possons, 1006 West 42nd Street, Los Angeles, Cal.; W. Scott Lewis, Krotono, Hollywood, Los Angeles, Cal.; Dr. Chas. Lin-

coln Edwards, Nature Study Department, Los Angeles City Schools; George E. Malcolm, 6015 York Boulevard, Los Angeles, Cal.; Chester P. Collins, Voltaire, Cal.; Frances G. Conrad, 556 South Hope Street, Los Angeles; Cal.; Allyn G. Smith, 2266 West 21st Street, Los Angeles, Cal.; Junius Henderson, State Museum, Boulder, Col.; Dr. Arthur D. Houghton, 809 South Kingsley Drive, Los Angeles, Cal.; F. J. Smiley, Occidental College, Los Angeles, Cal.

At the election of officers held during the October regular meeting the following were chosen: Paul Rüthling, President; Donuil Hillis, Vice President; Charles Richter, Secretary; E. P. Chace, Treasurer.

The committee members elected were: Membership Committee: Chairman, E. E. Hadley, E. P. Chace and F. Grinnell, Jr.; Publication Committee: Chairman, George Moxley, E. P. Chace, P. Rüthling.

HERE AND THERE

The Los Angeles Astronomical Society meets at the Los Angeles High School on the second and fourth Thursday evenings of each month.

A new exhibit of specimens illustrating Indian life in the interesting state of Arizona has been opened recently to the public at the Southwest Museum, Los Angeles. It is well worth visiting.

The headquarters of the Nature Study Department of the Los Angeles city schools, at 416 South Olive Street, is open on Tuesdays and Fridays from 3:30 to 5:30 p. m. Visitors are welcome. An attractive little museum is now being built as a model for all the city schools to follow in their collections of local material.

The Lorquin Natural History Club is named after Pierre Joseph Michel Lorquin, one of California's pioneer naturalists. Lorquin was born in France in 1797 and died in 1873 after a life of hardship and explorations to advance scientific knowledge. Several insects have been named in his honor. In a letter received by the club in September, an only grandson discloses the fact that he is living in San Francisco and is engaged in the taxidermy business.

The Cooper Ornithological Club meets at the Museum of History, Science and Art, Exposition Park, Los Angeles, on the last Thursday evening of each month.

In a letter to the editor, Jack Phillips, a charter member, describes his surprise at the way in which the Lorquin Natural History Club has grown in the year during which he has been absent in the north and announces that he will continue his studies during the coming winter at the preparatory department of the University of Southern California.

On a recent trip to the Yosemite Valley, R. Lyttle secured, at an altitude of 7000 feet, a Rubber Boa (*Charina bottae*, Blainville) at about eight o'clock in the morning. The Rubber Boa is interesting from the fact that it is one of the two true Boas which inhabit California. The Rubber Boa, like other members of the family, has near the base of the tail two spur-like vestiges of what once in the processes of evolution were legs.

Mr. Geo. L. Moxley is engaged in the preparation of a Field Flora of Southern California and would be very glad to have notes, specimens and botanical records from any and all members of the club.

FOR SALE, WANTS AND EXCHANGES

For 1½ cents a word, minimum charge 25 cents, you can insert a liner in this column if you have anything to sell, buy or exchange.

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LORQUINIA

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(Organized—August 1913)

Edited by Paul D. R. Ruthling, 1051 West 23rd St., Los Angeles.

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PLANT RESPONSE TO WEATHER CONDITIONS

It is very interesting to watch the native plants from season to season, especially from early spring till late autumn, and to notice the difference in appearance of the plants of the two seasonal extremes. These striking differences are the plants' responses to the changed weather conditions. Those of spring, or earlier, from January to the last of April, are subject to the expected rains and more or less cool weather; with these latter conditions favorable, there is a luxuriant growth of wild flowers everywhere to attract the general population. If the individual specimens of this host be examined they will be easily seen to be more or less succulent, comparatively short-lived and delicate. They have a short and easy existence in the cool, moist days of the early part of the year.

Beginning with the last of May and continuing until the cold weather and rains of December or later, we find a group of plants termed xerophytes, which grow where the moisture is very deficient, and the air dry and warm or hot, and which have adopted means of various kinds to guard against too great a loss of moisture. To me, these plants are very much more interesting than the other group because of this sharp struggle with the hard environment which has brought out various and distinctive points in the plants' physiognomy.

The general population seems to be unaware of this great variety of plant life during the dry season, and its interesting peculiarities. Just as soon as the conspicuous, luxuriant vegetation of spring commences to go, the would-be nature lover goes to sleep till next spring.

There are various ways by which protection against evaporation is attained. Among the trees and shrubs, especially those with evergreen leaves, the latter are greatly reduced in size, or there is a

thickening of the epidermis, giving them a leathery texture. The California Holly, *Heteromeles arbutifolia*, the needles of the conifers, *Rhus laurina*, *Rhus ovata* and others are examples of this method. Mountain mahogany, *Cercocarpus betulacfolius*, has small leaves thickened and covered with fine hairs. The evergreen oaks all have thick, stiff leaves. The manzanitas have the majority of the leaves in a vertical plane to the sun's rays like the eucalyptus and also others.

It is perhaps among the annuals, especially the very numerous Compositae, where we find the most common methods of protection. *Corethrogyne* has the whole plant covered with a white covering of fine hairs as a protection. *Grindelia camporum* has very thick or tough leaves and sticky glutinous heads. *Deinandra fasciculatum* has a resinous exudation to ward off the hot rays of the sun; and *Hemizonia lusulacolia* has the same. The Sun-flowers, *Helianthus*, have thick leaves covered with spiny or scale-like appendages. The Barberry, *Berberis*, a patch of which grows on Switzer's Trail in the San Gabriel Mountains, has excessively harsh spiny leaves.

There are numerous instances and kinds of protection among our xerophilous plants which are interesting and worth recording.

F. GRINNELL, JR.,
Pasadena, Cal.

OBSERVING THE FEEDING HABITS OF THE PACIFIC RATTLESNAKE

Of a rather well balanced judgment and with a philosophic attitude toward captivity, the Pacific Rattlesnake (*Crotalus oregonus*, Holbrook) eats, drinks and makes the best of life as a captive in the terrarium of an herpetologist. As a general rule the Pacific Rattlesnake is far less excitable than some species of rattlesnakes, and, for this reason, is an excellent member of the family for one to observe with regard to the food he eats.

In discovering what forms the food of any particular species of snake, the student has recourse to three methods. He may, by dissection, examine the contents of the stomachs of a large series of dead snakes. In the field he may, by accident and diligence, stumble upon snakes in the act of devouring prey. By keeping in captivity

living snakes, and by placing near the snakes various animals, the student may accurately state that the snake eats certain ones.

The first of these three methods is open to the objection that, in ascertaining what has been eaten, the observer learns little or nothing of the psychological behavior of the snake or of the manner in which the food is obtained.

In the field it is only rarely that one happens upon a snake in the act of consuming a meal, so that the field observations of a snake's feeding habits, although sometimes most valuable, are, nevertheless, too few as a rule to repay time used for this purpose alone.

A captive snake, through nervousness, often refuses food that he would eat were he at large in familiar surroundings, in suitable temperature or in environment otherwise better suited to his needs. On the other hand, it is possible often to ascertain more things eaten by certain species by observing two or three members of that species in captivity, than by dissecting a much larger number. The following observations have been made in this way, although a combination of the three methods is most satisfactory.

Among both old and young Pacific Rattlesnakes, a mouse is a much relished tid-bit. Other rodents, such as gophers, squirrels, kangaroo rats and even small rabbits are eaten by almost all individuals of this species that are large enough. Besides rodents, the Pacific Rattlesnake is, in youth, very fond of Fence Lizards (*Sceloporus*), and I have had as many as three in succession eaten by one small rattler. The adults do not seem to relish lizards as do the younger ones, and neither old nor young have ever harmed an Alligator Lizard (*Gerrhonotus scincicauda*) or a Brown-shouldered Swift (*Uta stansburiana*) in my collection. A few bats of an unknown species were once eaten by some of my rattlesnakes. The Pacific Rattlesnake is also fond of certain birds.

This rattlesnake is not at all particular about his food and is perfectly willing, provided that it *is* food, to waive the question of freshness and eat it alive or dead. When the animal to be eaten is alive, it is easily swallowed after having been killed by the venom. Mr. Virgil Owen believes that the crotaline (rattlesnake venom) acts as a digestive fluid and causes such disintegration within the body of the victim as to aid the digestive organs in the preparation for assimilation of the nutritive elements in the body of the animal eaten.

When the rattlesnake wishes to eat a mouse he has found dead in his box, he does not strike it as he does a living animal, but slowly and with great care, examines the body by protruding his delicate forked tongue and daintily touching the body here and there. Although it may have started from there, his examination almost invariably is completed at the snout, where the snake opens his mouth and, taking the head between his two jaws, begins the swallowing process. As a general rule, everything goes down head-first. I have, however, seen a Pacific Rattlesnake swallow a mouse tail first.

In the case of a living rodent, the snake, after striking, often waits four or five minutes for the animal to become dead, or nearly so from the effects of the poison, before approaching and examining the prey. Frequently, after striking, the rattler retains a firm grip and holds his victim in his mouth until the struggles cease or the snake thinks it is time to swallow his meal. For the victim this is a far more speedy and merciful death than that brought about after hours of suffering in some human-made trap that is supposed to kill instantly.

It is remarkable to see what enormous animals can be swallowed by a rattlesnake with a thin neck and a head no more than a quarter the size of the thing to be eaten. He is able to swallow such large morsels by means of the wonderful arrangement of the jaw bones and the extreme elasticity of the skin, the food being grasped and held by rows of small curved and fixed teeth set in the jaw bones, which are alternately released and advanced until the grip includes the entire animal, or everything but the tail. The mouse, or whatever it may be, is then forced down the alimentary canal by anterior contraction and posterior expansion of the muscles and ribs in the vicinity of the lump that designates the position occupied by the mouse. After a few minutes of twisting and pressing, the snake is ready either for another mouse, if another is forthcoming, or a warm secluded spot where he can coil up and ponder on the wonderfully satisfying effect of a good meal.

If one moves quietly when about his captive snakes, it is surprising to see how quickly the Pacific Rattlesnakes become accustomed to visitors and how unconscious he is of one's proximity if there be food on the menu. One little rattler was so tame that I could hold a Fence Lizard in my fingers in front of him without his becoming

frightened. Instead, if the lizard were alive, he would bite it; or, if it were dead, he would take it from my fingers and drag it to some place where he would eat it.

PAUL D. R. RÜTHLING,
Los Angeles.

THE SEARCH FOR VARIATIONS

In response to a request for something that would aid a club of young naturalists in their observations, I would like to suggest keeping an eye out for chance variations. The variability of organisms is one of their most striking qualities. The members of a species are not all cast in the same mold, but an examination of many individuals reveals now and again strange and unexpected departures from the normal form. These may be in some cases the incipient beginnings of a new race, and they occur in both plants and animals. These departures are by no means infinitesimal, but they may be strikingly different from the parent form. The laciniation of leaves or the compounding of their segments are among such variations. Alterations in color are perhaps the most frequent, and individuals with white flowers occur some time to time in all sorts of plants. Their seeds will usually reproduce the new form.

Variations which breed true in this way—and the large majority of these marked departures do come true—are known as mutations. As such they have been much written about by biological investigators in recent years.

Matters of variation become of particular interest when two or more related species occupy the same area. Many such pairs of species, as I have called them (On Pairs of Species, Botanical Gazette 61:177-212), occur among plants. A very interesting pair of this kind is constituted by *Adenostoma fasciculatum* and *A. sparsifolium* (common greasewood). The latter is much more southerly in its distribution, extending down into Mexico. But on the excursion from San Diego eastward to the Imperial Valley, following the meeting of the Pacific Section of the American Association for the Advancement of Science, I recently saw both species growing together over considerable areas. Yet there was no evidence of crossing, and little indication of variability in the hurried examina-

tion I was able to make. *A. fasciculatum* was entirely out of bloom, while *A. sparsifolium* was in full flower, so there is probably little opportunity for crossing. The two species are the only members of this isolated genus of Rosaceae, which is entirely confined to California in distribution. Yet they are remarkably unlike. *A. fasciculatum* is a smaller shrub with the leaves needle-like but rather fat, in fascicles. *A. sparsifolium* is considerably taller, reaching twenty feet in height, has its leaves scattered, and much longer and more slender. It is also delightfully fragrant. The two species differ also in the coloring of their bark and in other respects.

Altogether they constitute a very interesting pair of species, and a study of their variability, particularly in the region where they overlap, would be of much interest.

R. R. GATES,
University of California.

THE VARIETIES OF THE CALIFORNIA MUD TURTLE, OR CLEMMYS MARMORATO

As far as we know there is only one species of the California Mud Turtle (*Clemmys marmorato*, Baird & Girard). Of two specimens I have, the shell of one is five and a half by four and a half inches, while that of the other is four and a half by three and three-fourths inches. Both are adults from the immediate vicinity of Los Angeles. The smaller one, which is the common specimen, has on the upper surface of its shell five broad plates down the center, and four similar ones in a row on each side, twenty-four smaller plates around the edge of the shell and a narrow one above the neck.

On the larger turtle, from front to back in the center, the first three plates are like those ordinarily in the common species, the fourth is divided diagonally and the fifth is divided in such a manner as to make one oblong and one triangular shape. Of the two rows on either side of the center row, the right has five plates, the last being small; the left has six plates, the last two being small. Under the edge of the shell, the smaller turtle has twenty-four plates, while the larger has twenty-seven. Each has the same number of plates on the plastron.

ROBERT ELWIN,
Los Angeles.

QUERCUS MOREHUS, KELL.

Apropos of the article in the last issue of Lorquinia on the genus *Quercus*, it might be of interest to state that Dr. Kellogg's English name for the above mentioned species was Abram's oak. There was in him a vein of deep religious feeling, which frequently found expression in his botanical writings. "Trained by Wesleyan parents to daily reading of the Sacred Scriptures, his interest in them, and especially in the historical books of the Old Testament, deepened in after years; and, as botanists in general have been wont to draw names, or at least the suggestion of them, largely from Greek and Roman mythology, Dr. Kellogg in more than one instance drew from the Hebrew classics with which he was so familiar. Perhaps even the English name of Abram's oak which he proposed for his "*Quercus Morehus*" has failed to give a clew to the enigma of that specific name. It is the Doctor's Latinization of Moreh where the great patriarch of Bible fame once dwelt."—Condensed from a biographical sketch of Dr. Kellogg in Pittonia, 1:149.

G. L. M.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

"The Lives of Some Shells" will be the title of a lecture to be given by Emery P. Chace at the Tuesday evening meeting of December 5th in the lecture room of the Public Library on the tenth floor of the Metropolitan building. Members may bring friends. The meeting will be called to order at 7:45 p. m. The lecture will be illustrated by specimens from Mr. Chace's large and interesting collection.

Members and visitors are urged to bring to the meetings specimens about which information is desired or specimens that may prove of interest to others at the meetings.

Members wishing to contribute photographs for the photograph album must accompany such photographs with the name of the photographer, locality and, as nearly as possible, the date, with such other information as may be considered, by the photographer, to be of interest or importance. The Secretary has charge of the album.

The October number of Lorquinia was issued on the thirteenth of last month.

The Botanical Section of the Southern California Academy of Sciences held its first meeting of the season in the Music Room of the Los Angeles Public Library, Thursday evening, Oct. 26th. Sixteen persons were present, and a pleasant time was enjoyed examining some specimens sent from Idaho by Mrs. Bertha Fuller. Mr. J. C. Oliver was present and gave some interesting reminiscences of the discovery of *Helianthus oliveri*, Gray, which was found by and named for him. The meetings are held on the fourth Thursday of each month and all who are interested are cordially welcome.

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LORQUINIA

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PALEONTOLOGY—ITS PLACE IN THE STUDY OF NATURAL HISTORY

The study of paleontology has revealed many strange facts. It has revolutionized scientific thought regarding the created world and its inhabitants. Much of our present knowledge of the law of evolution is largely the result of paleontologic research. Paleontology is the basis of all geologic history. It takes up the story of life, beginning far back in geologic time when the earth was young. It begins with the first trace of life, searches the successive strata from the earliest Cambrian, follows it down through the ages and completes a wonderful tale, each step being as clearly defined, and all evidence as trustworthy as is found in any line of scientific research. Whatever our specialty may be in the study of natural history, much may be gained by research in the paleontological field.

As the astronomer lives far out in the space among the stars, measures their distances, defined their orbits, calculates their speed and watches the evolution of planetary systems from their primitive nebular condition, so the geologist lives among those strange beings that flourished many millions of years ago; for, as the astronomer regards space, so the geologist regards time. He sees the rise of the various types of life, watches their evolution and development from their first appearance, and sees them at their climax, when they flourished in great numbers and variety. He sees them in their declining days when they dwindle and die, to be replaced by others of a higher grade of organization and development.

The conchologist may find the earliest mollusks low and simple forms, yet fore-shadowing the coming of the brilliant and delicately tinted specimens in his cabinet today.

The ichthyologist finds in the Silurian rocks a very low form of fish that remained for a vast period of time the dominant type of life,

being the only vertebrate creature then existing, but foreshadowing the finny tribe, found in every sea, lake and stream today, and for which Izaak Walton and his disciples have always been thankful.

The ornithologist may look back to the *Archæopterix* of the Jurassic period and find there an ancestor of the feathered songsters of our day. Later, in the Cretaceous, the *Ichthyornis* and *Hesperornis* and other primitive forms still retained many of their reptilian ancestor's features, such as a mouth full of teeth and a long lizard-like tail.

The entomologist will be well repaid for research in the paleontologic field by the primitive forms of insect life. From the lower Silurian onward through succeeding ages, there may be found many objects of interest in the remains of various forms of insects, although records are not as complete as is the case with some other kinds of life.

The botanist also may have a share in the study of paleontology, for he may find traces of plant life from the earliest to the most recent. Paleontologists have brought to light many interesting forms of plant life, showing that there has been a gradual development in the vegetable kingdom as in the animal world.

Geologic history has been one oft repeated story of the rise and fall of races. Many races have arisen, flourished for a time, then dwindled and finally have become extinct. Their fossilized remains were left to tell the story of the day when they were in the height of their power, the story of their rise, increase in numbers and, in some cases, their attainment of enormous size. Then, for some cause, their course was halted, they began to decline in numbers and finally fell by the wayside, while some other race took their place and rose to rule during its allotted time, the same round being again repeated.

And so the course of life proceeds till the arrival of Man, who, in his untiring quest, seeks to unravel the tangled skein link by link, and lay before his astonished vision the whole plan which culminated in his own occupation and undisputed reign over a world that was grand and varied in all its aspects. Though he is yet in the infancy of his race, as compared in time with those that have preceded him, he has already outstripped them all and stands today at the head of the created world.

Now it is Man's privilege to look back over the geologic field, to take a survey of the whole plan of the creation of the world that

gave him birth, and to read the epitaphs that his predecessors have written in enduring stone. This he does and stands astounded at the result. Old legendary history becomes mere fairy tales. The cosmogonies of the world's wise men of a few centuries ago are tumbled in a heap of ruins, and in their place is erected a structure that it is believed must stand the test of time.

As Man sees how other races have arisen, flourished and had their day of supremacy, and how Nature, not yet satisfied with her efforts, has taken another great step and outdone herself in all past endeavors, he can but wonder, "What next? Has Man reached his limitations? Is this the ultimate?" This is not yet his to know, and these questions must go unanswered till time alone reveals what it has in store for the living world.

E. E. HADLEY,
Alhambra, California.

NOTES ON CREPIDULA

Naturalists are always interested in the study of variation, and the Conchologist is no exception to the rule. In the study of Molusca we find some species that are remarkably constant in form and others that are very variable. In *Crepidula onyx* Sby. we have a species in which the form of the shell is variable because it grows to conform to the surface on which it clings; while the shape of the deck, which is produced along the side of the shell on one side and notched back on the other, and the position of the apex on the margin of the open under-side, are constant.

When very small the animal settles on some firm object, clings there and grows for the rest of its days. The foot of the animal is protected by the base to which it clings and the shell is developed so that it covers the back and sides, the edge coming into close contact with the base.

Now we see the cause of the various shapes of the shells. If the base be a smooth plank the shell will grow regular in outline, smooth and rather flat; but if the base be a narrow curved surface like the shell of *Conus Californicus*, the crepidula will be narrow and deep. If the base is a rough rock the uneven surface is reflected in the shell, it being irregular in outline and having a rough surface. They are frequently found growing on the common scallop (*Pecten circu-*

laris), and in this case the shell shows ribs similar to the ribs of the Pecten. Crepidula are sometimes found on the very rough surface of *Astrea undoas*, such crepidula being very irregular in shape and usually small. Still another and quite distinct form is caused by the growth of one upon another, sometimes as many as 10 or 12 forming a cluster. These are deep and narrow, and have one edge much longer than the other.

The foot, which nearly fills the large opening in the shell, is not used for moving about because the shell grows to fit one particular spot on the base, whatever it may be, and there the crepidula clings with surprising tenacity. Should it fall from its perch or base, its open shell leaves it an easy prey to the crabs and fishes.

The color of the deck or septum is always white and the rest of the interior of the shell is chocolate or dark brown in color. These shells are common along our coast.

Another Crepidula which is only slightly less variable in form than *C. onyx* is *C. excavata* Brod. The distinguishing characters of this species are, first, the evenly curved deck, which extends along the shell at both sides; second, the position of the apex, which is distinctly raised from the edge of the shell; and third, the pocket or excavated space at the posterior end of the deck.

The outline and depth of the shell vary as in *C. onyx*, several varieties having been named. This species usually lives below the low tide mark and does not appear to be as common as *C. onyx*.

Crepidula dorsata Brod. is a common form that is found on the rocks of the breakwater at San Pedro at low tide. This little fellow is normally circular and rather flat. The deck is nearly triangular and has two sides free. The shell is white streaked with light brown, and the deck is white. The outside of the shell is frequently covered with nullipore.

Crepidula crepidula Lam. is the name of the little white slipper shell that we find living inside of dead univalves. When very small its shell is oval and flat; but, as it grows, it becomes long, narrow and bent to fit the concave surface on which it rests. This gives it the appearance, when taken from its base, of having grown inside out, the deck being on the convex side of the shell. With a hermit crab this little crepidula frequently shares the shell in which he is growing.

E. P. CHACE,
Los Angeles, Cal.

REPTILE NOTES

During the month of October, the following were observed by me in the Bradshaw Mountains in Arizona:

Ashy Horned Lizard (*Phrynosoma calidarium*). 7 specimens observed. Length $4\frac{1}{4}$ inches; length of tail $1\frac{1}{4}$ in.; width of body $1\frac{3}{4}$ in.; length of central horn $\frac{3}{8}$ in. Back very spiny; color ashy-grey, with light, black wavy cross markings; underside nearly white with a few small black spots near the throat; horns nine in number on the head, very sharp.

Tiger Rattlesnake (*Crotalus tigris*). 2 specimens observed. Yellowish grey, with a series of small black spots on the back and sides. Specimens measured 34 inches. A conspicuous dark bar extends from the eye to the angle of the mouth.

The Green Rattlesnake (*Crotalus lepidus*). 3 specimens observed. Color greenish grey on two specimens and vivid green on the third; all were banded with deep black bands; under side of vivid green specimen white, the other two, yellowish; length of vivid green (male) specimen 24 inches; the other two (females) were 20 and $18\frac{1}{2}$ inches respectively.

H. HILLMAN,
Los Angeles, Cal.

THE COLLECTING AND STUDYING OF ANIMALS AND PLANTS

In taking up the study of any part of natural history, the first thing a person wishes to know is how to collect and preserve specimens, and where to get apparatus for work. Natural history is primarily an observation study in the field and collection room. The first thing to know is how to find specimens in the field, the next is to study their structure and classification in the cabinet, then continuously and intensively to study further in the field their ecology.

The U. S. National Museum publishes a series of pamphlets which are necessary to anyone taking up natural history study. They may be obtained free by writing to the Secretary, Smithsonian Institution, Washington, D. C.

Some of these pamphlets in greatest demand are:

BULLETIN 39, Part 13, Directions for Collecting Recent and Fossil Plants, by F. H. Knowlton.

BULLETIN 39, Part E, Directions for Collecting and Preserving Reptiles and Batrachians, by Leonard Stejneger.

BULLETIN 39, Part G, Directions for Collecting Mollusks, by Wm. H. Dall.

BULLETIN 39, Part K, Directions for Collecting and Preparing Fossils, by Charles Schuchert.

BULLETIN 67, Directions for Collecting and Preserving Insects, by Nathan Banks.

BULLETIN 31, Directions for Collecting Minerals, by Wirt Tassin.

For those studying special lines of Natural History it is essential to keep in touch with persons in various parts of the country, and studying the same particular subject. The best way to do this is to subscribe to at least one periodical devoted to that subject. The names of a few periodicals of this kind may be of use to the enthusiastic student. Copeia is devoted to the study of snakes, lizards and fishes; the Condor to birds; the Entomological News to insects; The Nautilus to shells; and The Plant World to botany. The Journal of Geology, and Popular Astronomy are most excellent in their lines.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

REGULAR MEETING—Friday, January 5th, 1917, at the home of Paul Rüthhling, 1014 West 16th Street, at 7 p. m. Take West 16th Street red cars or West Adams Street yellow cars and get off at Toberman Street. Members only.

SPECIAL MEETING—Tuesday, January 2nd, 1917, in the Lecture Room of the Los Angeles Public Library on the tenth floor of the Metropolitan Bidg., which is between Hill Street and Broadway on Fifth Street. This meeting is for members and those invited by them. All members of the Los Angeles Astronomical Club are cordially invited.

With his planetarium, Prof. Melville Dozier will show and explain to us what is known of some of the common and wonderful laws governing the actions of our nearby planetary neighbors. The planetarium is a miniature model of the sun and four of the most important planets surrounding it, and shows the various movements of these bodies.

FIELD TRIPS—At the December regular meeting, there was appointed a field committee of three to have charge of a trip on Sunday, December 17th. The committee consists of Chairman Raoul M. May, Donuil Hillis and Robert Elwin. The destination and details will be announced.

The field trip to the Little Tejunga Canyon for December 3rd has been postponed to December 10th, on account of the weather. It will be an all-day trip. Bring lunch. Members will leave Los Angeles on San Fernando Stage and on Club automobiles. Those going by stage will meet Raoul May on the northeast corner of Sixth and Hill Streets at 6:45 a. m. Club automobiles will meet at same place one hour later and will leave at eight o'clock. Members taking stage will have four miles extra to walk from San Fernando Road to mouth of canyon. Fare in either case 50 cents, round trip. Telephone one of the committee if you can come and how. Chairman Paul Rüthling, 21158 or West 7184; Adele Schmidt, 269149; or Raoul May, 52214.

NEW MEMBERS--At the November regular meeting, Allyn G. Smith, of 2266 West 21st Street, Los Angeles, was elected an Active Member to fill a vacancy created by the failure of a former Active Member regularly to attend meetings. Mr. Smith joined the Club in the latter part of September, and is an enthusiastic conchologist.

The Membership Committee announces that it has accepted as Associate Members the following: Sarah R. Atsatt, 345 Serrano Avenue, Los Angeles, Cal.; Theodore Dranga, P. O. Box 244, Hilo, Hawaii; G. P. Engelhardt, Brooklyn Institute of Arts and Sciences, New York, N. Y.; Charles L. Camp, Livingston Hall, Columbia University, New York, N. Y.; Charles L. Fox, 1621 Vallejo Street, San Francisco, Cal.; Adele Schmidt, 5111 S. Vermont Avenue, Los Angeles, Cal.; Henry Hillman, 227½ East First Street, Los Angeles, Cal.; Dr. A. Denenholz, 2763 Bradford Avenue, Brooklyn, New York, N. Y.; and James Cuzner, Belmont School, Belmont, Cal. Mr. Cusner was formerly a charter member and has been a member of the Club ever since its organization.

HERE AND THERE

On Saturday, Nov. 11th, a field trip was held at the western end of Adams Street, Los Angeles. The trip was led by F. Grinnell, Jr., and attended by Charles F. Richter. A study was made of the zonal distribution of plant life in the vicinity of Ballona Creek. Many specimens were collected.

On Wednesday evening, the 29th of November, the Los Angeles Society of the Archaeological Institute of America was entertained at the home of Captain and Mrs. R. H. Miner of 649 West Adams

Street, where Frederick Monsen, F. R. G. S., exhibited numerous slides illustrating the wonders of the Southwest which the early Spanish conquerors explored. Some sweet Spanish songs were sung and refreshments were served. Representing the Lorquin Natural History Club the members who attended were Paul D. R. Rüthling, F. Grinnell, Jr., Henry Hillman and George E. Malcolm.

Prof. L. R. Abrams announces that he will issue a revision of his Flora of Los Angeles and Vicinity.

A correction: In the list of plants from the Santa Susana Mountains, on page 3 of this volume of Lorquinia, *Grindelia camporum* Greene should have been *G. robusta* Nutt., *Cercocarpus betuloides* Nutt. is probably *C. Douglassi* Rydb., and *Quercus obt* Nee. is a misprint for *Q. lobata* Nee.—G. L. M.

FOR SALE, WANTS AND EXCHANGES

LORQUINIA LINERS are read by scientists everywhere, scientific institutions and private collectors. Rates in advance, 1½ cents a word, minimum charge 25 cents. Donuil Hillis, Advertising Manager, 1051 West Twenty-third Street, Los Angeles, California.

WANTED—*Noctuidae* (the owllet or cutworm moths) from all localities. Also moths caught at light at night. In good condition and with data. Exchange desiderata. F. GRINNELL, JR., 690 E. Orange Grove Ave., Pasadena.

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WANTED—Living Snakes in exchange for southwest reptiles, preserved and alive, accurately labeled. PAUL RÜTHLING, 1051 West Twenty-third Street, Los Angeles.

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The last number of Lorquinia was issued on Friday, November 10, 1916

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A FEW RARE BEETLES FOUND IN LOGS NEAR PASADENA

On November 4th, while collecting along the margin of a small lake near Pasadena, California, I came upon a half dead willow, the dead part of which was full of "shot-holes" of borers. After hacking it open, one specimen of *Ptilinus basalis* was found dead in a burrow, and several specimens each of *Terestrius placitus* and *Micracis hirtella*. I have visited the same little glade three times since to examine the logs, and have been well rewarded for my trouble. The dates of these trips and the captures are as follows:

November 11, 1916.—Two small weevils of an undescribed species and six specimens of *Rlyncolus spretus* were found in a decayed stub, on which at some time termites had evidently been working.

November 12, 1916.—Fourteen *Micracis hirtella* and several *Terestrius placitus* were found in burrows.

November 18, 1916.—Three *Micracis hirtella* and fourteen *Terestrius placitus* in burrows. Two small Scolytids, probably of an undescribed species, were found in a twig. They were immediately under the bark, and, having been unable evidently to chew their way out, were found dead and with microscopic fungi growing on them. *Terestrius placitus* is parasitic on *P. basalis* and *M. hirtella*. This accounts for its being found in the burrows. It seems to feed on these beetles in both larval and adult stages; but little is known about this. I found three adults feeding on a dead *P. basalis*, which was about half devoured.

ALONZO DAVIS,
Pasadena, California.

THE COLLECTOR AND HIS WORK

The collecting of specimens is a very important part of the study in natural history in whatever branch we may be interested. The work of the collector is indispensable to science.

Though we have not the technical knowledge of the savants, and, therefore, are unable to write learnedly and at great length on profound and intricate problems, which only the trained student may handle, it is within the power of us all to render great service to science by keeping our eyes open and never neglecting opportunities for making observations or collecting specimens wherever we may go. By so doing, the collector may feel that he is having a share in the work of unraveling the mysteries which Nature holds.

While he is in this way endeavoring to contribute something for the advancement of science, he is constantly experiencing new surprises, viewing new scenes.

Is it at all strange that one who has once enjoyed the pleasures of collecting should love to go forth into the open fields—Nature's workshop—and, in anticipation of some new revelation or view that has long remained hidden, never tire, but be lured on and on with the hope that he himself may discover the fields before him, and therefore add his mite to the sum of human knowledge?

Is it not strange that so many pass by oblivious, without heeding the call of Nature, inviting them to take a look, if but for a moment, at the monuments she has erected, at the work she has been performing since time began, or that so many pass from earth without realizing that they have missed the best part of the performance enacted on the stage of Creation, where all characters are real and where there are no shams or make-up?

E. E. HADLEY,
Alhambra, Cal.

SHELL COLLECTING AT SAN PEDRO

On the afternoon of November 25th, 1916, a very low tide enabled F. Grinnell, Jr., Geo. Malcolm and E. P. Chace to collect shells about the Breakwater at San Pedro, California. The Nature Study Department of the Los Angeles Schools was also present, about 1000 children being under the direction of Dr. Charles L. Edwards and his assistants.

Several *Nudibranchs* were collected by the children. *Nudibranchs*, some of which are very beautifully colored, have no shells and are called naked molluscs. This group includes those forms which are commonly called sea-hares.

LORQUINIA

At one o'clock wide stretches of rocks were uncovered, so old shoes were put on and collecting was begun. The shore between the land end of the Breakwater and Point Firmin is very rough, consisting largely of ledges of soft rock and loose rocks of all sizes. On account of a thin layer of mud which covers all the rocks except those near the high tide, the collecting here is not as good as in former years. Some of the rocks are covered with moss and sea-weed, and some kelp grows on the rocks at the outer edge of the tide-flats. We found the little brown limpet, *Acmaea incessa* Gld., living on the long stems of the kelp, on which it feeds and, in some cases, eats holes through the stem. The ledges of soft rock already mentioned are an ideal place for the boring species of bivalves, several of which were dug out with a hammer and cold-chisel brought along for this purpose. It is quite a task to dig the large *Parapholas californicus* Conr. out of the rock, two of the four specimens which I dug out having been broken in the process. The exact manner by which these species bore their holes in the rock is not definitely known.

One specimen of the pretty *Cypraea spadicea* Gray was taken. Years ago this species was quite common at this point, but continued collecting has nearly exterminated it. The smallest shells found were a few *Ceacum orcuttii* Dall, which were on the under side of a rock picked up in a tide pool. This pretty brown tube is only about 4 mm. long and $\frac{3}{4}$ mm. in diameter.

One valve of the rare *Antigona fordii* Yates, was picked up in a tide pool. This is the second valve that I have found in four years' collecting, less than a dozen specimens that have been taken in good condition being known to me. Beach worn valves are frequently found near the light-house at Point Loma by San Diego collectors.

The large *Ischnochiton conspicuus* Cpr. were taken freely, some of the specimens being 4 inches long, and very fine, the interior coloring ranging from orange to pale blue. Several other species of Chitons were taken, including six *Lepidopleurus rugatus* Cpr.

Crabs were very plentiful and of many species. Two large rock crabs, probably of the genus *Cancer*, were taken as was also one fine large kelp crab which is not uncommonly caught in fishermen's lobster traps in deeper water. Many *Tegula* shells, in which hermit crabs were living, contained specimens of the little white slipper shell, *Crepidula crepidula* Lam.

The following 37 species were found:

PELECAPODA

Adula falcata Gld.
Cardita subquadrata Cpr.
Cumicinia lamellosa Sby.
Callucina californica Conr.
Milneria minima Dall.

Parapholas californicus Conr.
Pholididea penita Conr.
Platyodon cancellatus, Conr.
Septifer bifurcatus Rve.

GASTERAPODA

Acmaea incessa Gld.
limatula Cpr.
patina Esch.
scabra Gld.
Alvania sp. indet.
Astraea undosa Wood.
Ceacum orcuttii Dall.
Crepidula crepidula Lam.
Columbella carinata Hds.
Cypraea spadicea Gray
Fissurella volcano Rve.

Haliotis cracherodii Leach.
Hipponyx antiquatus Linn.
tumens Cpr.
Lacuna sp. indet.
Leptothyra carpenteri Pils.
Macrochasma crenulata Gray
Murex festivus Hds.
Norrisia norrisii Sby.
Purpura nuttallii Conr.
Tegula aureotincta Fbs.
viridula ligulata Mke.

POLYPLACYCOPHORA (Chitons)

Callistochiton decoratus Cpr.
Ischnochiton clathratus Rve.
conspicuus Cpr.
Lepidopleurus rugatus Cpr.

Mopalia muscosa Gld.
Trachydermon dentiens Cpr.
hartwegii Gld.

E. P. CHASE,
 Los Angeles, California.

Azolla filiculoides Lam.—This tiny pteridophyte is growing abundantly in the Los Angeles River between North Main Street and North Broadway. Not only is it growing in the water, but also at the water's edge, in the sand, there are many rounded tufts two to three or more inches in diameter and nearly an inch in height, much as some mosses grow in eastern and northern woods.—G. L. M.

Ctenucha brunnea Stretch.—Emmet Meek found this pretty blue moth swarming by the thousands around a yellow composite shrub in the Los Angeles River bottom, near Elysian Park, in September, 1916, and later in the same month with the writer, they were found still as abundant, and many were captured in good condition. Although they seem to be somewhat sluggish in behavior, they are wary and are not so very easy to net. This is the first time this insect has been noticed in such numbers. It is not common in collections.

F. GRINNELL, JR.

FIELD TRIP TO THE LITTLE TEJUNGA CANYON

Sunday, December 10, 1916, was spent by a party from the Lorquin Natural History Club, in exploring the vicinity of the junction of Gold Creek and Little Tejunga Canyons.

Seventeen enthusiastic hikers, constituting a group which included specialists in several branches of natural history, visited the ranch of Mr. Sparkuhle, an old German settler and miner, who exhibited a number of specimens of local minerals collected by him.

From Sparkuhle's Ranch the route led the party up Gold Creek Canyon to a flat under some live oaks, where lunch was eaten. After some of the members continued up the canyon further, the entire party returned by crossing over the divide which separates the canyon from the Little Tejunga, and following the latter down to the starting point.

Biologically the trip could not be called very successful, because it was unfavorable for the observation of many forms of life that were dormant at that time.

Of great interest to all was Dr. Hillman's explanation of the formation and history of oak galls, many of which were found all day long. Beneath the branches of a large oak, the party gathered about him as he explained and dissected a large oak gall, in which was found a tiny but fully matured hymenopteran which had developed within.

Raoul M. May collected some insects. Some plants were gathered by members of the party, and one Alligator Lizard, *Gerrhonotus*, was observed abroad. F. Grinnell, Jr., contributed to the plant knowledge of some of the members, while E. E. Hadley engaged with others in knotty problems concerning the geological formations. Golden California poppies in bloom, and the buds of wild peonies, served with other plants to indicate an abnormally premature seasonal development of plant life due to early rains followed by sunshine and mildness.

As a picnic the trip was thoroughly enjoyed and is being planned among others for the next spring when collecting is at its best.

Members possessing old numbers of Lorquina, especially Number 1, will confer a favor upon the Club by donating to the Publication Committee any old copies they would otherwise throw away or destroy. Geo. L. Moxley, Chairman.

THE BOULDER LODGE AT SWITZER'S CAMP

This unique structure, built entirely of rocks in the heart of the San Gabriel Mountains, is a suggestion and a beginning of a mountain natural history laboratory. There is a collection of butterflies, reptiles, plants, bird skins and a few mounted mammals representative of the local fauna. The Lodge designed and built by Lloyd B. Austin is the social center of this mountain resort, but the natural history side has his intense interest, sympathy and help.

Some day it is hoped to have an equipped mountain laboratory for the study of the biological problems presented by mountains. We have numerous seaside laboratories: but the natural history of the mountains is just as suggestive and interesting as that of the seashore and has received less attention.

Visit Boulder Lodge and think about the greater natural history laboratory.

THE REIGN OF THE TRILOBITE

The Tribolite lived in the Cambrian time,
When the flag of his race he unfurled;
Supremely he reigned, though he burrowed in slime—
He was king of the primitive world.

Onward he marched and feared never a foe,
Save the merciless ravage of time.
He believed that the world and all here below
Were created for him and his kind.

The down-trodden mollusk he passed with a sneer,
And the coral-polyp he ignored;
So all lowly creatures just trembled with fear,
As the dark dismal deep he explored.

The Cambrian passed, and the fishes appeared
To rule in Silurian time—
They disputed the realm of the Tribolite race,
Which thenceforth began to decline.

And so it has been since beginning of time:
A ruler may rule but a day.
Both he and his realm soon must decline,—
His glory is doomed to decay. —E. E. H.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

REGULAR MEETING—Friday evening, February 2nd, 1917, in the home of Raoul M. May, at 7 P. M. Address, 2202 West 10th Street. For Active Members.

SPECIAL MEETING—On the evening of Tuesday, February 6, 1917, at 7:45 P. M., a meeting will be held in the lecture room of the Los Angeles Public Library on Fifth Street between Hill and Broadway. Visitors are welcome. The program shall consist of:

1. The Preparation for Natural History Study, by Dr. Frank C. Clark.
2. The Life of Louis Agassiz, by Mr. Geo. L. Moxley.

Members of the Club are invited to attend the meetings of the Santa Monica Biological Club on the third Fridays of each month at the home of Dr. F. C. Clark, 526 Wilshire Blvd., Santa Monica.

The Membership Committee has accepted as Associate Members the following: Miss Edith M. Aims, 9 E. 126th St., New York, N. Y.; Dr. William Barnes, 319 Millikin Bldg., Decatur, Ill.; Mr. Stuart S. Towne, 910 Ave. 65, Los Angeles; Mrs. A. L. Alexander, 800 S. Mentor Ave., Pasadena, Cal.; Mr. Robert L. Beardsley, 621 Citizens' National Bank Bldg., Los Angeles; Mr. Alfred Hepper, 53 West 72nd St., New York, N. Y.; and Carl L. Hubbs, Stanford University, Palo Alto, Cal.; Mr. Carl Yens, 955 W. 23rd St., Los Angeles; Dr. John Adams Comstock, 321 S. Hill St., Los Angeles; Dr. Leroy Henry, 229 N. Bunker Hill Ave., Los Angeles.

HERE AND THERE

R. Little has recently returned from the north, where he has been collecting bird skins with Dr. Jesurun in the vicinity of Palo Alto.

The Nature Association of the pupils of the City Schools was organized on December 8th, 1916. Fifty-eight enthusiastic young naturalists will explore seaside and mountains under the direction of Dr. Edwards of the Nature Study Department.

In an effort to force legislative action for the protection of the Sage Grouse, which is in danger of extinction, the Permanent Wild Life Protection Fund issued on December 1st, 1916, Bulletin No. 5, by

William T. Hornaday. The facts set forth in this bulletin help wonderfully to awaken from their lethargic stupor the slaughterers of the country's wild life, and will surely accomplish much. The bulletin has been sent to the Editor, from whom all members are welcome to borrow it.

The receipt of the American Museum Journal, beginning with the number of January, 1916, is gratefully acknowledged as one of the latest additions to the library of the Lorquin Natural History Club. Members may borrow copies at 1051 West 23rd street, where it is sent monthly.

A very low tide enabled E. P. Chace, F. Grinnell, Jr., and George E. Malcolm on Saturday, November 25th, to make an interesting survey of the local marine fauna near the foot of the San Pedro breakwater. A large number of interesting shells, some of them fairly rare, were observed and explained by Mr. Chace to the two lepidopterologists accompanying him.

FOR SALE, WANTS AND EXCHANGES

LORQUINIA LINERS are read by scientists everywhere, scientific institutions and private collectors. Rates in advance, 1½ cents a word, minimum charge 25 cents. Donuil Hillis, Advertising Manager, 1051 West Twenty-third Street, Los Angeles, California.

BATS—I have a few Pale Bats, alcoholic or alive, for exchange in mammals. **LUTHER LITTLE**, Box 291, Sierra Madre, California.

WANTED—*Noctuidae* (the owlet or cutworm moths) from all localities. Also, moths caught at light at night. In good condition and with data. Exchange desiderata. **F. GRINNELL, JR.**, 690 E. Orange Grove Ave., Pasadena.

AQUATIC LIFE

An Illustrated Monthly Magazine on the breeding of Goldfish, Tropical Fishes, other animals and their life histories in the home aquarium. Per year, \$1.00. Per copy, 10 cents.

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The last number of Lorquinia was issued on Friday, December 8, 1916.

LORQUINIA

Published by the Lorquin Natural History Club

(Organized—August 1913)

Edited by Paul D. R. Ruthling, 1051 West 23rd St., Los Angeles.

Volume 1
Number 7

Los Angeles, Cal., February 1917

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LEPIDOPTERA

A Few Notes on a Collecting Trip Around Palm Springs, Riverside County, California.

I collected from March 19th to April 7th, 1916, around Palm Springs, which is situated on the edge of the Colorado Desert, and at the base of the eastern side of the San Jacinto Mountains. The elevation at the Springs is 455 ft. above sea level, whilst in the canyons on each side it reaches 1500 to 2000 ft. in the accessible parts.

I had expected to collect more on the desert, but, with the exception of *Lycaena marina* and a few Theclas, did not find many things flying.

In former years I had heard of the desert sands being carpeted with massed colors of brilliant *Abronias*, *Gilias* and the desert *Aster*, but this spring no such sight was to be seen, as probably the exceptionally heavy rains during the two previous months had washed the seeds away or covered up the plants. This may account for the scarcity of butterflies on the desert. However, the flowers, including several varieties of cactus, were very plentiful in the canyons where I spent the greater part of my time collecting. Though handicapped by strong winds, yet I managed to take 38 different species of butterflies, 20 of which were new to my collection.

The following is a list of my captures:

Melitaea gabbii, resembling *M. palla* of central and northern California.

Melitaea chara. These diminutive butterflies were very numerous around *Beleperone californica* bushes.

Melitaea augusta (?) I came upon a species of *Melitaea* which I take to be *augusta*, but am not yet certain as to its identity.

Synchloe californica. This interesting butterfly, described in 1906 by Mr. Wm. Greenwood Wright, I found very abundant in

Chino Canyon, the type-locality. I forwarded a series of this species to a lepidopterist friend of mine in England, Dr. Crowfoot of Beccles, who, after comparing them with specimens in his collection of *S. saundersii* from Colombia, *S. lacinia* from Texas, *S. fassli* from Ecuador, expressed an opinion that these four Synchloes were forms of one widely distributed species, *S. californica* being the most beautiful of all, and well characterized by the chain of large fulvous spots near the margins of both wings. This is in agreement with the conclusions arrived at by Mr. Victor Duran and Mr. Fordyce Grinnell, Jr., as set forth in an article appearing in the Entomological News of April, 1915 (Vol. XXVI, No. 4) who, after examining and comparing specimens of *S. saundersii* from Argentina and Venezuela, *S. lacinia* from Texas and southern Arizona, and *S. californica* from Arizona and the Colorado Desert, were of the opinion that these three Synchloes represented geographical forms of one species found from Argentina to California.

Lemonias mormo. I saw and took only one of this species, which may be a variation of *L. virgulti* as described in the "Biología Centrali-Americana."

Calephelis australis. This insect was fairly abundant on the edge of the desert, flying low among the brush growing on the sides of dry stony washes.

In my captures, the Lycaenidae family was represented by *Thecla melinus*, *T. iroides*, *T. dumetorum*, and a *Thecla* of a light brown color, which I have as yet been unable to identify. *Lycaena polyphemus* or an unnamed related form, *L. sonorensis*, two forms of *L. acmon*, *L. exilis*, *L. marina* and a very small dark *Lycaena* which I take to be a southern form of the *L. battooides* collected by me in the High Sierras in July 1915 at an altitude of 12,000 ft. (This form must be *enoptes* or a form of it; I have it from the Santa Rosa Mountains.—F. Grinnell, Jr.

The Hesperiidae were rather scarce, yet I managed to collect 10 different species, of which I identify

Copaeodes candida Wright. *Hesperia montivaga* Edw.

Pyrgus tessellata Scud. *Nisoniades persins* Scud.

N. funeralis Scud.—Burg.

and a large gray skipper which may be *Hesperia domicella* Edw.

Besides the above I took 4 specimens of *Systasea pulverulenta*, which is usually described from Arizona and Mexico. This insect

was very difficult to capture owing to the swiftness of its flight and color resemblance to the ground.

The remaining butterflies taken were:

<i>Pyrameis cardui</i> Linn.	<i>Papilio eurymedon</i> Boisd.
<i>Limenitis lorquini</i> Boisd.	<i>P. rutulus</i> Boisd.
<i>Terias nicippee</i> Linn.	<i>Anthocharis australis</i> Grinnell
<i>C. harfordii</i> , var. <i>barbara</i> Hy. Edw.	<i>A. sara</i> , var. <i>reakirtii</i> Edw.
<i>Colias eurytheme</i> , var. <i>keewaydin</i> Edw.	

C. L. FOX,

San Francisco, California.

THE CONSERVATION OF THE CALIFORNIA DEER

There is a movement at present being started to close the deer hunting season in California. This is a very worthy object and one which should be generally encouraged and supported by those interested in the prevention of the extermination of our most beautiful wild animal.

The passing of the bison and the passenger pigeon are well known themes dwelt upon at great length by advocates of game conservation. Still the lesson can never be learned too well and while under our present laws such disgraceful and criminal slaughter would be impossible, yet we are too prone to delay the needed legislation to avoid this same fate on the part of our game birds and animals.

It is only natural that the deer should recede before the advance of civilization, but the automobile gives such quick access to distant points, and renders the long trip of a decade ago to one of but a few hours now, that slowly but surely the deer are being driven into the most inaccessible parts of the mountains.

Old-timers have told the writer about shooting deer in the hills surrounding the present site of Inglewood and the writer has seen a small doe feeding within a few hundred yards of the Santa Monica car line, a mile or two west of Hollywood, when that road was first constructed.

Dana records that in 1837 the hills of the present Golden Gate Park were fairly alive with deer that fearlessly stood and watched the sailing vessels passing through the Gate and that everywhere in California deer were in abundance.

The ever increasing number of hunters and the modern high

power rifles will soon spell the end of the deer hunting unless the season is closed for at least a term of years. Every year, preceding season, in a burst of wild enthusiasm, the newspapers invariably announce the deer as being more plentiful than they have been for years, but nevertheless the writer's personal observations show a terrible decrease in the last five years. Even should the letter of the law be observed and no females killed, which sad to say is far from the actual case, yet a few years more will reduce the deer to that point where they will never permanently increase in their wild state, but can only be perpetuated in parks and reserves as are the bison of today.

CHESTER P. COLLINS,

Voltaire, California.

At the last regular meeting of the Lorquin Natural History Club, held on Friday, January 5th, 1917, a motion was passed instructing the Secretary to draft a letter copies of which are to be forwarded to California legislators in an effort to have them pass laws favorable to the protection of rapidly diminishing wild life. This motion was aimed in particular at the protection of the Sage Grouse. "Conservation of the natural features of the world is coming to be of great interest and importance as population increases and threatens these features. We want to leave something of the natural for future generations to study," says F. Grinnell, Jr.

**COLLECTING NOTES FROM A MEMBER
IN HILO, HAWAII**

Mr. Theodore Dranga writing from Hilo, Hawaii, tells of collecting at night as follows:

"While living at the beach recently a bright moon and a low tide in the evening promised good opportunities for collecting, so taking an electric flashlight along, I went out. One of the first finds was a live clam, *Venus purpura*, the first live specimen that I ever saw. To a California collector a live clam does not mean much, but here there is a notable absence of large sand and mud bivalves and not many small ones, all of which are rare. A live specimen of *Triton obscurus* was also found and I might say that I was very lucky, as this species is very seldom taken alive.

"The pretty *Nerita polita* was taken freely. It is almost impossible to find these during the day as they stay down among the rocks

and gravel out of sight, but at night they come out on the rocks. I have collected only two small specimens before sundown.

"The second evening that I went out I found 4 large *Cyproea*.

"In wet weather the *Melampus castaneus* are thick on the dead leaves and rubbish along the high-water line and are easily collected.

"There are many species of minute *Tornatellinidae* all about here, everywhere in fact, both arboreal and terrestial, and many of them not yet named. I expect to collect some of them this spring and summer for Dr. Cooke of the Bishop Museum, Honolulu."

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

Meetings

REGULAR MEETING—Friday evening, March 2, 1917, at 7 o'clock. Place will be announced by postal card. For active members and by special invitation to associate members.

SPECIAL PUBLIC MEETING—Tuesday evening, March 6, 1917, at 7:45 o'clock, in the Lecture Room of the Public Library, 10th floor of the Metropolitan Building, Los Angeles. Mr. E. E. Hadley will speak on the Geological History of Plants and Animals, illustrating his remarks by a fine chart, drawings and specimens. The public is invited.

GEOLOGICAL SECTION—The Geological Section of the Lorquin Natural History Club will be formed on the third Tuesday evening in February in the Music Room of the Los Angeles Public Library, 8th floor of the Metropolitan Building, at 7:30 o'clock. All who are interested in any phase of earth study are invited. Mr. E. E. Hadley is in charge of arrangements and has reserved the Music Room for the third Tuesday evenings of the months for the Geological Section Meetings.

February 11th: Field Excursions

Mount Washington and Southwest Museum. Take northbound yellow Garvanza cars, or red Annandale, or South Pasadena cars, on Main St., at 11:00 A. M. Go to Avenue 50. Meet at Avenue 50 and Monte Vista St. at 11:45 A. M., leaving five minutes later. If on red car, walk one block west to Monte Vista St. Wear every-day clothes for visit to Museum and walk over hills. Bring lunch. 3 miles. For members and friends. Round trip carfare 10c.

February 18th:

Hollywood Park Hills via Cahuenga Pass. Meet at corner of Fourth and Hill Sts., at 8:00 A. M. Leave at 8:10 A. M. on Hollywood car to Highland Avenue, thence north to pass. For members. 5 miles. Bring lunch and wear old clothes. Carfare, 5c each way.

February 25th:

Flintridge and Devil's Gate Region. Meet at P. E. Depot (6th and Main) at 7:30 A. M. Leave at 7:51 via Pasadena Short Line; one way ticket. Change to Lincoln Ave. car at Colorado and Fair Oaks. From the end of line go one block north, then west on Boulevard to Devil's Gate. 5 miles. Bring lunch and wear old clothes. Carfare, 25c.

March 4th:

Baldwin Hills. Meet at end of West Adams St. car line at 8:00 A. M., leaving at 8:15 A. M. About 5 miles. Lunch and old clothes.

March 10th (Saturday):

Elysian Park. Meet at the Fremont (North Broadway) Entrance at 8:00 A. M. Bring lunch. All members invited. Walk about 2 miles.

March 11th:

Little Bear Canyon. Meet at P. E. Depot (6th and Main) at 7:30 A. M. Take 7:41 Pasadena Short Line car: round trip ticket 25c. Transfer to Altadena car and pay 5c additional. Off at Mariposa St. Go north to Millard's Canyon. Follow trail up canyon and over ridge into Little Bear. Bring enough lunch for 7 miles each way, and stout hiking clothes.

For further information communicate with members of the route committee, Stuart S. Towne, telephone Garvanza 308, R. L. Beardsley, telephone West 474, or Adele Schmidt, telephone 269149 or F4216.

Membership Committee

At a recent meeting of the Membership Committee it was decided that a limited number of invitations to regular meetings of the Club be reserved for Associate Members who are interested enough to care to attend. There will always be four invitations available for Associate Members, and, in case no distinguished visitors or invited outsiders swell the attendance, there will be room for two additional

Associate Members. The obvious necessity of limiting the number of members attending the regular meetings, where the Club business is transacted, will be apparent to all, because these meetings are held in the homes of members who have not the seating capacity to invite all, much though they would like to.

Members may obtain invitations to regular meetings by applying to any Active Member or to the Membership Committee (Chairman, Mr. Hadley, Mr. Grinnell and Mr. Chace). Active Members, before issuing invitations to others, must obtain permission from the Membership Committee first.

The following have been accepted as Associate Members: Dr. Roy E. Dickerson, 114 Burnett Ave., San Francisco, Calif.; Dr. Samuel Stillman Berry, 745 W. Highland Ave., Redlands, Calif.

HERE AND THERE

On January 28, 1917, five Lorquin Club members, Beardsley, Richter, Rüthling, Grinnell and Town, walked up Mt. Lowe and through the snow on the sky-line connecting it with Mt. Wilson. From the summit of Mt. Wilson the party descended by way of the Little Santa Anita Canyon to Sierra Madre, where it visited another Club member, Luther Little, whose collections were inspected.

At a meeting of the Santa Monica Biological Club on Friday evening, January 19, 1917, held at the home of Dr. Frank C. Clark, 546 Wilshire Blvd., the Lorquin Natural History Club was represented by Raoul M. May and F. Grinnell, Jr., who, on invitation of Dr. Clark, spoke briefly. The chief lecture of the evening was by N. D. Knupp, teacher in the local high school of Santa Monica. Mr. Knupp had for his subject, Reproduction in Plants.

Mr. E. P. Chace and Dr. Henry collected mollusks and crabs on and near the Breakwater at San Pedro. The tide was very low at 3:18 P. M., so that good collecting ground was uncovered. Among the material taken were 1 *Monia macroschisma*, 4 species of *Crepidula*, 10 species of *Chitons*, 2 species of *Hipponyx* and many others, among which were several specimens of Brachypods (*Terebratralia transversa*). Several specimens of *Aphlysia californica* and two or three other small Nudibranchs were seen. Three species of crabs were taken.

Dr. Samuel Stillman Berry of Redlands is making a special study of the *Chitons* with a view towards revision or monographing.

The Conchological Club of the Southwest Museum will meet at the Museum on Friday, February 13th, at 2:30 P. M. Those interested in the study of shells are invited.

The Botanical Section of the Southern California Academy of Sciences met in the Music Room of the Public Library, on Thursday evening, January 25, 1917. The Lorquin Natural History Club was represented by three active and two associate members. Informal discussion of plants submitted by different people was indulged in.

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FOSSILS FOR EXCHANGE—Carboniferous and Tertiary. Send for list. E. E. Hadley, 123 South First Street, Alhambra, Calif.

INSECTS EXCHANGED by Raoul M. May, 2202 West Tenth Street, Los Angeles, Cal. Any insects except lepidoptera. Hymenoptera preferred.

WANTED TO BUY—Good second-hand telescopic camera tripod. Metal tubes preferred. Give description and price. Address Box 4, Lorquinia, 1051 West Twenty-third Street.

AQUATIC LIFE

An Illustrated Monthly Magazine on the study of the life-histories of native and exotic fishes, the goldfish breeds and other animals in the home aquarium; the care of the aquarium and its plant life. Per year, \$1.00. Sample copy free.

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PLANTAE GRINNELLIANAE. I.

Under the above caption I expect, from time to time, to write some notes of the various collections of plants coming into my hands from our fellow Lorquinian, Mr. Fordyce Grinnell, Jr.

Mr. Grinnell is a good collector and a keen observer of both plants and insects. He has brought many plants to me to be added to my herbarium or otherwise disposed of, and the first lot was collected in the Sierra Nevada mountains in the summer of 1914. Some of them were easily identified, some had to be sent away for identification, and some were laid away for further study.

The present paper will consist chiefly of a partial list of this first lot, with locations. The compositae were identified for me, for the most part, by Prof. H. M. Hall, of the University of California.

Brodiaea grandiflora Smith. Paradise Valley, 7000 ft. Aug. 6.

B. laxa Wats. Paradise Valley, 7000 ft. Aug 6.

Piperia lancifolia Rydb. Horse Corral Meadows, July 23.

Eriogonum nudum Dougl. Copper Creek, Aug. 1.

Polygonum amphibium L. Horse Corral Meadows, July 23.

Spraguea umbellata Torr. Paradise Valley, Aug. 6.

Aquilegia truncata F. & M. Horse Corral Meadows, July 23.

A. caerulea James. Charlotte Lake, Aug. 13.

Delphinium scopulorum Gray. Horse Corral Meadows, July 23.

Erysimum asperum DC. Bullfrog Lake, Aug. 2.

Sedum obtusatum Gray. Copper Creek, Aug. 1.

S. roseum Scop. Bullfrog Lake Basin, Alt. 11,000 ft. Aug. 12.

Heuchera rubescens Torr. Copper Creek, Aug. 1.

Sericotheca discolor (Pursh) Rydb. Copper Creek, Aug. 1.

Drymocallis monticola Rydb. Horse Corral Meadows, July 23.

D. incisa (Lindl.) Rydb. Bullfrog Lake, Aug. 12.

Cercocarpus ledifolius Nutt. Copper Creek, Aug. 1.

Rosa Californica C. & S. Copper Creek, Aug. 1.

Geranium Richardsonii F. & M. Horse Corral Meadows, July 23.

Epilobium paniculatum Nutt. Horse Corral Meadows, July 23.

Gayophytum ramosissimum T. & G. Copper Creek, Aug. 1.

Ledum glandulosum Nutt. Bullfrog Lake, Aug. 12.

Gilia aggregata Spreng. Copper Creek, Aug. 1.

This is a very beautiful plant. The large tubular flowers vary in color from scarlet to salmon pink, or even white.

G. pungens Benth. Copper Creek, Aug. 1.

Phacelia circinata Jacq. f. Horse Corral Meadows, July 23.

Pentstemon confertus Dougl. Horse Corral Meadows, July 23.

Pentstemon confertus Dougl. Bullfrog Lake, Aug. 10 and 12.

The Bullfrog Lake specimen has somewhat shorter scapes and more congested heads than the other, showing, probably, the effect of a higher altitude, but is otherwise much the same.

E. salsuginosus Gray. Horse Corral Meadows, July 23.

P. Bridgesii Gray. Copper Creek, Aug. 1.

Mimulus luteus L. Horse Corral Meadows, July 23.

Castilleja stenantha Gray. Copper Creek, Aug. 1.

Pedicularis groenlandica Retz. Horse Corral Meadows, July 23.

P. attollens Gray. Bullfrog Lake, Aug. 12.

Solidago multiradiata Ait. Copper Creek, Aug. 1.

Aster Andersonii Gray. Bullfrog Lake, 10,634 ft. Aug. 12.

Chrysopsis Breweri Gray. Copper Creek, Aug. 1.

Erigeron compositus Pursh. Mt. Rexford Ridge, 13,000 ft. Aug. 12.

E.salsuginosus Gray. Horse Corral Meadows, July 23.

E. Breweri Gray. Copper Creek, Aug. 1.

E. Elmeri Greene. Copper Creek, Aug. 1.

E. divergens T. & G. King's River Canyon, Aug. 9.

E. Coulteri Porter. Horse Corral Meadows, July 23.

Antennaria media Greene. Bullfrog Lake, Aug. 12.

Chaenactis Douglasii H. & A. Copper Creek, Aug. 1.

Helenium Bigelovii Gray. Copper Creek, Aug. 1.

Senecio triangularis Gray. Horse Corral Meadows, July 23.

Hieracium horridum Fries. Copper Creek, Aug. 1.

GEO. L. MOXLEY,

Los Angeles, Cal.

THE TRIP TO THE LAVA FLOW

My father and I left Waiochinu at 8 A. M., May 25th, 1916, to see the lava flow. We followed a ranch trail up the slope of Mauna Loa, crossing an old lava flow for six miles, and then travelled another six miles through forests. The trail was poor, it rained considerably, and the high elevation was noticeable by the chilly air. The forest was interesting, being composed of great koa trees, often ten feet in diameter, and numerous smaller trees and undergrowth.

We arrived at the flow about 4 P. M. It was a barren waste of indescribably rough aa lava. It was not flowing, but there were numerous cracks, showing molten lava beneath the cooler crust. The flow was from 6 to 12 feet above the level of the solid ground, and pieces were continually falling down from the top, covering more ground all the time. There were no trees standing in it except at the edge, and most of these were burning. The flow was composed of separate chunks of the roughest sort of lava known, ranging in size from fine dust to five ton pieces, and the heat was intense.

When night came we made a fire by putting large sticks into the fiery cracks, where they immediately began to burn. We made such a large fire that the dead tree that sheltered us caught fire and we had to leave it.

The scene was one of awful desolation. Just in front of us the glowing cracks showed weirdly through the black lava, and here and there a flaming tree trunk. Farther up the slope was a line of trees and above that a lurid red glow, surmounted by a black sky. The only sounds were the wind and the occasional clink of falling pieces of lava.

We lay down and slept close to the lava, where a large smouldering log at the edge of the flow protected us from the falling pieces. We were scorched on one side by the heat, while on the other we were chilled by the cold wind, and sometimes were choked by the gas coming from the burning log. At 4:30 A. M. we arose and, taking a final look at the fiery scene, started for civilization. The trip seemed endless, but we finally arrived at Waiohinu, very tired and mighty glad to get back.

THEODORE DRANGA,
Hilo, Hawaii.

A REVISED LIST OF LOS ANGELES SNAKES

Since the publication in Copeia No. 15 of my list of Los Angeles snakes, the list has been found incomplete. The following list comprises the names of snakes observed by me within a half day's walk of the city of Los Angeles since 1913.

1. Rosy Boa, *Lichanura roseofusca* Cope.
2. Pacific Bull Snake, *Pituophis catenifer* Blainville.
3. Boyle's King Snake, *Ophibolus getulus boylii* Baird & Girard.
4. Coral King Snake, *Ophibolus zonatus* Blainville.
5. LeConte's Snake, *Rhinochilus lecontei* Baird & Girard.
6. Red Racer, *Zamenis flagelliformis frenatus* Stejneger.
7. Blue Racer, *Zamenis constrictor flaviventris* Say.
8. Striped Racer, *Zamenis lateralis* Hallowell.
9. Western Garter Snake, *Thamnophis parietalis* Say.
10. Pacific Garter Snake or "Water Snake," *Thamnophis hammondi* Kennicott.
11. Patch-nosed Snake, *Salvadora grahamiae* Baird & Girard.
12. Western Ring-neck Snake, *Diadophis amabilis* Baird & Girard.
13. Rock Snake, *Hypsirhina ochrorhyncha* Cope.
14. Tantilla, *Tantilla eiseni* Stejneger.
15. Pacific Rattlesnake, *Crotalus oregonus* Holbrook.

PAUL D. R. RÜTHLING,

February, 1917.

Los Angeles, Cal.

PROTECT THE ROADRUNNER

This curious and interesting bird is one of the best friends the California bee-man has, and every beekeeper should use his influence to enforce the law protecting them.

They are shy, almost solitary—a true inhabitant of the desert—and are being rapidly driven away from all irrigated sections. I shall always remember my first sight of one, not knowing its name or even that there was such a creature. My little son who was with me, as we watched one scooting at racehorse speed through the stubble, exclaimed, "Why, Pop, it looks like a young dragon!"

I flushed one the other day, going to an out-yard. For a

quarter of a mile it kept an even distance ahead of the auto, never taking wing, at a speed of 15 miles an hour.

After examining the stomachs of 80 California "roadrunners," Dr. Harold C. Bryant, of the Fish and Game Commission, has found instead of the eggs of other birds, nothing but insects, which were for the most part injurious to farmers.

Astonishing feats of swallowing are performed by the roadrunner. It destroys more hairy caterpillars than any other California bird—even the woolly-bear caterpillar, which few other birds will tackle. One roadrunner was found which had swallowed a horned toad an inch wide, another whose stomach contained four full-sized lizards. One taken in Arizona contained a garter snake 20 inches long, and a California roadrunner contained several young rattlesnakes. With this highly spiced diet, the roadrunner seems to need little water, thriving on the hottest deserts, and in captivity rarely drinking more than twice a week, and never taking a bath—except in dust.—*The Western Honey Bee*.

CHARLES FREDERICK HOLDER

There has been recently placed in the Reference Room of the Public Library a memorial tablet to the well-known Naturalist, bearing, along with a basrelief medallion portrait, the following inscription: "Charles Frederick Holder. 1851-1915. Author, Naturalist, Sportsman. This tablet is placed here by friends of the naturalist who devoted himself to the preservation of wild game and sea life: who awakened the public conscience to the rights of bird and beast and fish, and whose work won at once the approval of sportsmen and the tributes of nations."

Among the literary works of Mr. Holder may be mentioned: Elements of Zoology; Louis Agassiz, his life and work; Life in the Open; Recreations of a Sportsman on the Pacific Coast; Log of a Sea Angler; Big Game at Sea; and All About Pasadena.

RECORD YOUR OBSERVATIONS

One of the first things for a would-be naturalist to learn should be the habit of close and accurate observation of all phenomena of

nature, habits of animal or insect life, or manner of growth of plants, with their variations and forms. The next, and fully as important, is the habit of invariably setting down notes of these observations for future reference. Record your observations, not your guesses. Theories of natural law based upon records of observations extending over a period of time may very closely approximate truth, and may be very satisfying to the observer and possibly add to the sum of human knowledge. Theories based upon guess-work will satisfy nobody and may—more likely will—prove to be very misleading. Record your observations, but be sure they are observations.

G. L. M.

MEMBERSHIP COMMITTEE

The Membership Committee takes pleasure in announcing that the following have been accepted as Associate Members of the Lorquin Natural History Club, and joins the Club in extending a hearty welcome to the new members: Mr. Enrico Piazza, 2348 Fargo Street, Los Angeles; Mr. Emmett Meek, 3287 Arroyo Seco Ave., Los Angeles; Mrs. D. C. Rüthling, 1051 West 23rd Street, Los Angeles; Miss Gertrude Paulus, 4555 Glen Albyn Drive, Los Angeles; and Mrs. Nanno Woods, 1222 Milford Street, Glendale.

At the Friday evening meeting of March 2nd, 1917, Harry B. Waller, one of the Club's most enthusiastic geologists, was elected an ex-Active Member, because he had moved from the city.

George E. Malcolm and Stuart S. Towne were elected Active Members.

Among the recent valuable accessions to the Club Library are a complete set, so far as published, of the Science Bulletin of the Brooklyn Institute of Arts and Sciences and the Bulletin of the Museum of Comparative Zoology at Harvard College.

At the first meeting of the Geological Section, held in the Music Room of the Los Angeles Public Library, Tuesday evening, Feb. 20th, twelve persons were present in spite of the rainy weather. Mr. E. E. Hadley spoke of the aims of the Section and showed some fossils, mostly from the diatomaceous shales of West Alhambra. Dr. C. L. Edwards made some suggestions regarding the work of the Section. Mr. George L. Moxley presented part of a fossil fish and a 'leaf, found in the shales of Fort Moore Hill, at Broadway and California Streets.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

Meetings

SPECIAL MEETING—Tuesday evening, April 3, 1917, in the lecture room of the Los Angeles Public Library on the tenth floor of the Metropolitan Building, between Hill and Broadway, at 7:45 P. M. Raoul M. May will speak on The Life of a Bee, illustrating his lecture with specimens from his collection. The public is cordially invited.

REGULAR MEETING—Friday evening, April 6, 1917, at the home of E. P. Chace, 7629 Walnut Drive, north of Nadeau Street, 7 P. M. Take Watts local red car; get off at Nadeau Street, walking two blocks east to Walnut Drive. For Active Members and, by special invitation, for Associate Members.

GEOLOGICAL SECTION—The Geological Section will meet on Tuesday evening, April 17, 1917, in the Music Room of the Los Angeles Public Library at 7:30 P. M. Eighth floor of the Metropolitan Building. Outsiders interested in geology are cordially invited to attend.

The Conchological Club of the Southwest Museum will meet at the Museum on Tuesday, March 13th, at 2:30 P. M. Those interested in the study of shells are invited.

Field Trips

March 18th:

Topango Coast. Take 8 A. M. Venice Short Line car at Hill Street Station, to North Beach, Santa Monica. Round trip 50c. From Santa Monica take auto bus to mouth of Topango Canyon. 25c each way. Explore coast line and small canyons north of Topango. Low tide at 12:23 P. M.

March 25th:

Whittier and Puente Hills. Take 8:07 A. M. Whittier car from Los Angeles P. E. Depot on 6th and Main Streets. Buy one-way tickets, 35c. Walk over rolling hills to several peaks about 1500 ft. elevation. Fine views, flowers and oaks. Out via Puente. Auto stage line to Los Angeles, 50c. Distance 7 miles, or more if desired. Cafeterias.

March 31st:

Santa Susanna Mts. Camping and collecting trip of four or five days. Meet at Tally-Ho Garage, near First and Broadway, at 7:45

A. M. Round trip 75c. Bring blankets, provisions, plant-pliers, etc. Trip will be led by Mr. Fordyce Grinnell.

April 1st:

San Pedro Hills. Take Redondo car leaving P. E. (Hill Street) Station at 7:35 A. M. Buy one-way ticket to Cliffton. Walk over hills to San Pedro. 10 miles. Canteens.

April 7th:

Pacoima Wash. An interesting association of plants and animals is to be found in the Pacoima Wash, near San Fernando. Take the San Fernando bus at First and Broadway, at 8 o'clock. Fare 25c each way. Party will be led by F. Grinnell, Jr.

April 8th:

Mt. Hollywood and Griffith Park. Take 8:45 A. M. Hollywood car from north side of Hill Street P. E. Station to Western Ave. Go north, meeting at end of trail on top of Mt. Hollywood for lunch. Walk over hills, returning via Irvine Station on Glendale Line. Those so desiring may visit Griffith Park Zoo. 5 or 6 miles.

April 15th:

Little Tejunga. Take Auto Stage leaving Tally-Ho Garage, 109 N. Broadway at 7 A. M. Fare 75c round trip. Those making special arrangements may leave on Club automobiles from corner of 6th and Hill Streets at 7:45 A. M. Fare 60c round trip. Members only.

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Los Angeles, Cal., April 1917

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A SHORT LIST OF THE MOLLUSCA

Collected at White's Point, Calif., by Allyn G. Smith,
August 14-18, 1916.

White's Point proper is a group of ledges jutting out into the ocean about two and one-half miles north of Point Firmin, which marks the entrance of San Pedro Bay. The ledges run parallel with the coast line and are connected to the mainland by a strip of sandy beach nearly covered at high tide. Two small bays, one on either side of the sand strip, are created by the main ledge of rock which acts as a sort of breakwater protecting the rocky beach from the full force of the waves. When the tide is at its lowest many more ledges appear than are at first apparent and these are interspersed with tide pools both large and small. Along the shore are masses of broken rock of all sizes. Due to this particular arrangement of rock and quiet water shell collecting, particularly of the smaller species, is excellent.

The methods used to collect might be of interest. It is not at all necessary to confine one's collecting to times of low tide only, although a greater variety may of course be found at this time. The long fronds of kelp and seaweed often harbor many small species, and when the tide was very low quantities of this was brought in and piled on the beach to be looked over at high tide. Eel grass was treated in the same manner and was found to be especially productive if roots and all were brought along. Tide pools were thoroughly examined and yielded many finds. The chiton family is found in these more commonly and can be taken from rocks covering the bottom. The balance of collecting was done by overturning rocks both large and small along the shore and carefully examining their under surfaces.

White's Point has long been a collecting ground well known to conchologists. In the past it was the location of an abalone camp maintained by the Japanese, and the catch from the Channel Islands as well as the mainland was brought here for drying. In the heaps of moss covered shells left there from time to time rare and fine species have been found. This day is past, however, and the collector must now confine his energies to the ledges and tide pools.

The list here included is far from being complete and should not be considered so. It is, however, an indication of the more common species likely to be met with at the present time, and it is hoped that it will be of some interest.

Acmaea incessa Gould. Common on stems of kelp.

limatula Carpenter. A few young ones taken.

paleacea Gould. Plentiful on eel grass.

scabra Gould. Fairly common on the rocks.

Alvania purpurea Dall. One specimen only.

cosmia Bartsch. Three found.

Amphissa versicolor Dall. Not common.

Barleeia haliotophila Carpenter. Several taken from kelp.

Bittium interfossa Carpenter. Three taken.

attenuatum Carpenter. Common in crab colonies, but only sparingly found alive.

Cæcum orcutti Dall. Exceedingly common under small stones. The nuclear, or early whorls were found here for the first time.

subimpressum Carpenter. Less common than the last.

Cardita subquadrata Carpenter. Fairly plentiful.

Cerithiopsis carpenteri Bartsch. Four specimens.

cosmia Bartsch. More common than the last.

 (*necropolitana* Bartsch). Four shells doubtfully referred here.

pedroana Bartsch. The most common of the genus.

Clathurella (species indet.). One only.

Columbella carinata Hinds. A few found.

gausapata Gould. Exceedingly common.

penicellata Carpenter. Not very plentiful.

Corbula luteola Carpenter. Found sparingly only.

Cryptomya californica Conrad. One specimen.

Cumingia lamellosa Sowerby. Very common in roots of eel grass.

Diplodonta subquadrata Carpenter. Scarce.

Epitonium crenatooides Carpenter. One young one.

hindii Carpenter. Quite common.

Ethalia supravallata Carpenter. Found with the next.

supravallata *invallata* Carpenter. Found in colonies usually close to *Ischnochiton conspicuus* Carpenter.

Eulithidium substriatum Carpenter. Common on the kelp.

Fossarus fenestratus Carpenter. Sparingly found.

Fusinus luteopictus Dall. Very common. This species was egg laying and the egg capsules were quite plentiful under rocks.

Gadinea reticulata Sowerby. A few found. Not common.

Haliotis fulgens Philippi. Young ones only.

cracherodii Leach. Common.

Halistylus pupoides Carpenter. Only one taken.

Hipponyx antiquatus Linne. Occurs sparingly.

tumens Carpenter. Less common than the last.

- Lacuna (sp. indet.) One or more species.
Leptothyra paucicostata Dall. Rare.
 baccula Carpenter. Very common.
Liota acuticosta Carpenter. Three specimens.
 fenestrata Carpenter. Two only.
Mangilia (sp. indet.) At least two species of this difficult genus were taken.
Marginella californica Tomlin. Rather scarce.
 jewettii Carpenter. Rare. Five specimens.
 pyriformis Dall. Three shells found.
Megatebennus bimaculatus Dall. Three small specimens.
Milneria minima Dall. Fairly plentiful.
Mitramorpha aspera Carpenter. Two examples.
 filosa Carpenter. Not common.
Odostomia eucosmia Dall and Bartsch. Two only.
 donilla Dall and Bartsch. Rather scarce.
 helga Dall and Bartsch. Fairly plentiful.
 nota Dall and Bartsch. Roots of eel grass.
 oldroydi Dall and Bartsch. Rare.
 pedroana Dall and Bartsch. One example.
 phanelia Dall and Bartsch. Rare.
pulcia Dall and Bartsch. One of the commonest *Odostomias*.
 subturrita Dall and Bartsch. Roots of eel grass.
 virginalis Dall and Bartsch. Common.
Pecten giganteus Gray. One young specimen.
Pedipes unisulcatus Cooper. Two from the drift.
Purpura nuttallii Conrad. Fairly common.
Phacoides californicus Conrad. Dead pairs common.
Phasianella compta Gould. Not plentiful.
 pulloides Carpenter. Rare. One specimen only.
Rissoina dalli Bartsch. Three taken.
 kelseyi Dall and Bartsch. Two examples.
Seila montereyensis Bartsch. Six or eight foun^l.
Serridens oblongus Carpenter. Found in and under the mantle of
 Ischnochiton conspicuus only. It appears to be commensal.
Siphonaria (Williamia) poltoides Carpenter. One example.
Triphoris pedroana Bartsch. A rather scarce species.
Tritonalia circumtexta Stearns. Plentiful.
 gracillima Stearns. Not common.
Tornatina cerealis Gould. Apparently rather rare.
Truncatella stimpsoni Stearns. No living specimens found.
Turbonilla buttoni Dall and Bartsch. Several shells doubtfully referred to this species.
 laminata Carpenter. Two found.
 muricatoides Dall and Bartsch. One example probably belongs under this head.
 tenuicula Carpenter. The commonest *Turbonilla* found.

Vitrinelli oldroydii Bartsch. Nearly always taken near *Ischnochiton conspicuus*.

Callistochiton decoratus Carpenter. Common.

Chætopleura gemmea Carpenter. A number taken.

Ischnochiton clathratus Reeve. The most plentiful chiton.

conspicuus Carpenter. Large and fine specimens were plentiful.

magdalensis Hinds. Not as common as the foregoing.

Lepidopleurus rugatus Carpenter. Found sparingly only.

Mopalia muscosa Gould. Young ones only taken.

Tracydermon dentiens Gould. Quite common.

hartwegii Carpenter. Very common.

February 24, 1917.

SOME NOTES CONCERNING THE PALLID BAT

Atrozous pallidus pacificus Merriam.

The Pallid Bat ranges more or less throughout the Austral Zones west of the Rocky Mountains, as far as Lower California.

In color these bats are a yellowish drab, under parts clear and unmixed, with darker back, but irregularly shaded by the dusky tips of the hairs.

They are fairly large in size, and have a body length of about one hundred and twenty millimeters, the length of the forearm being about fifty-four millimeters. The ears, when bent over the nose, measure about twenty millimeters beyond the tip. The teeth are very strong and can give a pretty good bite when the bat is molested. These measurements, of course, vary according to the size of the bats.

In Sierra Madre during the day the favorite hiding places of these bats are in dark cracks or crevices, such as those between the walls of houses, in attics or in old barns.

The first colony I found in the month of May. These bats had selected a narrow tunnel-like space between the ends of the roofing and the box-like gable facings of an old barn. They had evidently lived in this place for years, for the droppings were very thick in the lower ends of the gables.

For the entrance to the tunnel-like space the bats crawled through a hole at the apex of the gable, this giving them access to both sides. To reach the bats, I went up to the loft and poked in between the roofing boards with a stick. In a few minutes the bats began to emerge above me. Some flew back and forth, while others crawled in the spaces at the other end of the barn.

The boy with me armed himself with a stick, and, when they came near him, knocked the bats to the floor. From the blow of the

stick, the bats in a few minutes were sprawling here and there on the floor.

After picking up some of the female bats, I was very much surprised to find, clinging to the breasts, one and sometimes two young. They were hairless, black in color, and their eyes had not yet opened. Apparently the female flew as well with her young passengers as she would without them. I am inclined to believe that the female carries the young until they are old enough to care for themselves. I observed that while I had them in captivity, the young always stayed with the mother. If separated, the baby kept up a peculiar squeaky twitter until it found her again.

I kept the bats for several weeks and tried feeding them on flies, hamburg steak and milk, but without success.

LUTHER LITTLE,

Sierra Madre, California.

Reference: North American Fauna, No. 13. Revision of the North American Bats of the family Vespertilionidae, pp. 45, 46.

L. L.

LIGHT REACTIONS OF MALVA PARVIFLORA

The common mallow, or cheeseweed, *Malva parviflora* L., is an excellent study for phototropism, or plant attraction towards sunlight. It had been noticed for some time that this common weed was strongly plagiotropic as far as its leaves were concerned. That is, the blades of the leaves were placed at more or less of a right angle to the direction of the rays of sunlight. Wherever the plant was observed most of the leaves were inclined in the general direction of the sun.

In early morning long before sunrise the blade of the leaves faced a general easterly direction. As the sun rose they faced it directly and followed it as it ascended toward the meridian. Throughout the afternoon they continued to follow it until at sunset they occupied a position opposite to that of early morning. Thus during the day the entire leaf made a turn of half a circle.

At nine o'clock at night the leaves had reversed their direction, most of them now facing a direction varying from south to southeast. At midnight the position was practically the same as at nine o'clock. What was most noticeable, however, was the fact that at least seventy per cent of the leaves were facing the south side of an east and west line. Most of the remainder had a general horizontal position, the inclinations being slight and indefinite. There were but few north-easterly inclinations.

Day and night observations made during a light rain showed that the leaves then had little respect for direction, facing north and south promiscuously.

From the above observations the following conclusions may be

drawn: *Malva parviflora L.* is very noticeably phototropic. Also, physiologically; leaves of plants under ordinary conditions arrange themselves so as to receive the maximum amount of light on their faces, from which the fact can be deduced that light is necessary for plant nutrition and growth.

STUART S. TOWNE,
Los Angeles, California.

VARIATION IN LEPIDOPTERA

In the foothills back of Tallac, Lake Tahoe, in July, 1916, a female specimen of *Limenitis Lorquini*, remarkable for its size and marking, was taken.

It spreads two and five-eighths inches across the wing tips, and the wings are broader and rounder than in the normal form. The white spots on the primaries are smaller than usual, and, where the edge of the wing would normally be, there is a row of nine faint white dots. The wing extends from one-eighth to three-sixteenths of an inch beyond these dots, giving the appearance of an extra black band. The secondaries are marked similarly in this respect.

The brown tint on the tips of the primaries extends inward along the costa to the first set of white spots, of which there are four, with a suggestion of the fifth, and along the side of the wing nearly to the angle.

In the secondaries, or hind wings, the edge of the wing is curved in between each vein. There is a fringe of short white hairs between each vein. This marking is so pronounced at the fifth vein as to suggest the beginning of a tail. The insect as a whole presents a very striking appearance.

There were three or four specimens like the one described above noticed where this one was taken, but they were in bad condition. It is possible that this may be a local variety, as none of the normal form were noticed.

A peculiar female of *Colias eurytheme* was taken in Eagle Rock in late 1916. It is slightly smaller than the normal, spreading one and one-half inches. The submarginal row of yellow spots is covered over with black, with the exception of two dots, faintly discernible. On the underside of the primaries there are three large and two small black dots at the inner edge of the dark outer border. The underside of the secondaries is much like the normal form. The entire specimen is rather deep and dusky, having a black shadow over a greater portion of the wings.

GEO. MALCOLM,
Los Angeles, Cal.

A very pleasing notice of LORQUINIA appeared in the January-March number of The American Fern Journal for which we wish to thank the editor. The Journal is the organ of the American Fern Society and ought to be in the library of anyone who is in the least interested in ferns. The price, including membership in The American Fern Society, is only \$1.00 per year, or without membership, 90c. Subscriptions and applications for membership should be sent to Mr. E. J. Winslow, Auburndale, Mass.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

Meetings

Public meeting Tuesday evening, May 1st, at 7:45 o'clock, in the Lecture Room of the Public Library, 10th floor. Dr. A. D. Houghton will speak on "Plant Tropisms."

Geological Section. Tuesday evening, April 17th, in the Music Room of the Public Library. There will be a microscopic demonstration of the so-called Monterey Shale, showing the remains of the minute organisms composing it. Also a talk on Protozoa, the simplest forms of animal life.

Field Trips

April 22nd:

Mt. Lowe and San Gabriel Peak. Meet at Pacific Electric (Main Street) Depot at 7:30 A. M. Take Pasadena Short Line car, leaving at 7:41 A. M. Round trip 35c. Walk about 16 miles.

May 5th (Saturday):

Los Angeles River Bottom from North Broadway Bridge, leaving there at 8 A. M.

May 6th:

Franklin Canyon. Take 8:45 Hollywood-Santa Monica car at Hill Street Station between Fourth and Fifth Streets. About 8 miles. Those not wishing to walk so far may take trackless trolley from end of Laurel Canyon car line to Lookout Mountain, where they will meet the rest of the party in the afternoon.

May 13th:

Maple Canyon. Take 9:00 A. M. Glendora car at rear of P. E. Depot (Main St.) to Monrovia. Walk about 8 miles, or less for those preferring to wait in Sawpit Canyon.

Membership Committee

The Membership Committee takes pleasure in announcing the acceptance of the following as Associate Members and joins the Club in extending to them a hearty welcome: Mr. Knox Hagar, 2015 S. Grand Ave., Los Angeles; Prof. Trevor Kincaid, University of

Washington, Seattle, Wash.; Mr. H. E. Lougheed, 1109 Glendon Way, South Pasadena, Cal.; Mrs. J. H. Drain, 941 Park View Ave., Los Angeles; Mr. J. A. Barbieri, 1450 Locust St., Pasadena, Cal.; Mr. H. M. Duncan, 605 S. New Hampshire Ave., Los Angeles; Miss M. Cynthia Dickerson, American Museum of Natural History, New York; Mr. Hermann Klotz, Chavez Ravine Road, Los Angeles.

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INSECTS EXCHANGED by Raoul M. May, 2202 West Tenth St., Los Angeles, Cal. Any insects except lepidoptera. Hymenoptera preferred.

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RANDOM NOTES ON THE COLLECTION AND PRESER- VATION OF CHITONS

By S. Stillman Berry, Redlands, California.

Although perhaps the brief notes here offered contain nothing which is absolutely new, I have received in correspondence so many more requests for some outline of method for the care of chitons in the field than I could reply to in the proper sort of detail that the preparation of a brief article on the subject for general circulation has been the logical result. I should mention in passing that except for one or two species taken in the Mediterranean my only experience in collecting these animals has been along the Pacific Coast of North America, but I have no reason to doubt that the same methods which experience has shown to be adapted to the conditions in this region would be equally successful elsewhere.

Although so remarkably a homogeneous group in outward form, the various species, or sometimes groups of species, of Polyplacophora show a surprising specificity in habit, and each is rarely, if ever, found outside its own peculiar station. Some species and even genera, for instance, are found in the hollows of rough boulders in the mid-tide area, others affect the shallow pools which on a rocky shore become accessible long before the tide has reached its ebb, others occur on jutting headlands among the mussels, many only under rocks or in their deepest crevices. One species alone (*Cryptochiton*) I have noted to occur at times upon sandy beaches. Some species are to be obtained only by dredging, and even then seem to inhabit only restricted areas, as in Monterey Bay, where I have found several forms nowhere outside a certain bank of hard blue clay, its jutting crags often covered by an incrusting sponge of a purple red color very similar to that of several of the chitons which are generally abundant on such fragments as are broken off and brought up by the dredge. Some species are found only at the lowest tides or dredged, —the zone of others is left behind in the retreat of even a moderate tide. If the collector wishes a complete representation of the fauna, he must give practically every type of situation a thorough search.

In general I think it may be said, at least on our coast, that the most favorable area for chitons is from the low-tide line to perhaps

30 fathoms, where the bottom is rocky, or strewn with boulders or rock fragments and large shells. Here a rich harvest is invariably to be obtained.

Whether on shore or at sea, I find the same simple collecting outfit indispensable. This should include:

1 broad, thin-bladed knife.

1 old scalpel or penknife (for dislodging the more minute specimens).

A few small buckets or jars.

A series of small flat smooth-surfaced sticks like rulers, cut into convenient lengths, but of assorted widths. Except for *Cryptochiton*, which requires special treatment, a width of 3 inches is ample for the largest.

A few ordinary glass microscope slides.

A plentiful supply of narrow *white* (or undyed) cloth tape or very soft twine. (I usually find it an advantage to include both.)

A supply of 70% alcohol.

A large bucket or canvas knapsack as an all-inclusive container for the outfit.

The animals are easily loosened from the surface to which they cling by a quick, neat insertion of the knife-blade beneath the edge of the girdle. Each should then be promptly transferred to one of the sticks of appropriate size (or if a small specimen, to one of the slides) previously well wetted with sea water, and bound in position by several turns of the tape or cord before there has been any chance for curling to take place. Care should be taken to bind firmly enough to hold the animal in position, yet without the exertion of force sufficient to break the often delicate and fragile valves. It sometimes happens, with the best of precautions, that a specimen curls up before it can be bound to its stick. In such cases a forcible attempt to straighten it is only likely to break the shell or otherwise result in damage to the specimen. It is much better to drop the animal loose into the collecting bucket and cover it with sea water. If it has not meanwhile straightened out of its own accord, upon returning to base the collector may place it in a bowl of fresh sea water, where, if in good health, it will in time usually assume the normal position. In tying the chitons to the sticks a convenient and space-saving practice is to bind down two or more specimens at once by placing them on opposite faces of the stick simultaneously. As each stick or slide becomes filled to its capacity it may be dropped into weak alcohol or placed in sea water pending return to camp or laboratory. Here each stick should be carefully examined to ascertain whether any of the animals have perchance crawled from under the twine, or "slipped their moorings," so to speak.

The whole may then be immersed in weak alcohol for an hour

or two, or in fresh water for a longer period, my own results having been much better by the former method, after which the animals may be passed through two or three changes of alcohol in ascending concentrations, remaining in each for perhaps a period of ten or twelve hours, until they are brought into a solution of 70-75%, which is sufficient for their permanent preservation. More concentrated solutions of alcohol only serve to harden and warp the tissues and should be avoided. After the specimens are in the 70% alcohol they may be untied and will thereafter retain their natural outlines if allowed to lie free in the preserving medium.

In my experience formalin solution is an exceedingly poor medium for the preservation of chitons. *Do not use it.* If nothing else is available, however, no pains should be spared to transfer the specimen to 70% alcohol at the earliest opportunity. Methyl (wood) alcohol likewise is not to be recommended as anything but a makeshift, and even denatured ethyl alcohol is much less satisfactory than the pure article.

If the specimens are desired for histological work, more careful methods of fixation and hardening should be undertaken, though even here I have sometimes had surprisingly good results with the rough method I have outlined. Ryder, in Dall's well-known pamphlet of "Instructions for Collecting Mollusks," p. 43, gives some excellent "Directions for preserving the soft parts of Mollusca," and to these I would refer the interested reader.

If it be desired to preserve the specimens in the dry state, the animals may be killed either in weak alcohol or fresh water as already suggested, then unbound, the soft parts carefully cut away with a sharp knife, and the "shell" (*i. e.*, the valves and girdle) firmly retied in a flat position until the girdle has *thoroughly dried*, and there is therefore no further risk of the specimen curling. Specimens dried on glass adhere so strongly to the smooth surface that the mantle does not usually contract against the valves as in most specimens one sees and results in exceptionally beautiful examples.

Nevertheless, the desirability of preserving a large proportion (if not the whole) of a given catch *in alcohol* cannot be too strongly emphasized! By so doing the collector will certainly find his labor to count for far more in a scientific way. Many important characters of chitons are greatly obscured and sometimes lost entirely through being subjected to the process of drying. This is in some cases true of even such important matters as *family* characters, and many a priceless specimen has lost more than half its value because of the collector's neglect of this fact. There is no doubt that the lack of material suitably preserved in alcohol has, more than any other single circumstance, delayed our understanding of this curious and difficult group of mollusks.

Especial pains should be taken with the bearded chitons, and no chiton "with whiskers," even the smallest, should be dried or cleaned, but killed carefully in the expanded condition and preserved in alcohol. Great care should be taken not to damage the various bristles or other processes of the girdle. Cotton, owing to the certain entanglement of its fibres in the chaetae, is not a satisfactory packing material for such specimens, gauze or cheese-cloth being better for the purpose.

Field notes on the station, habits, relative abundance, etc., of all species found are always worth while, while a label with the date they were taken and accurate locality data should always accompany the specimens after final preservation. Should opportunity occur to observe oviposition or any other peculiar habits of the animals, as much information should be obtained as possible and carefully recorded.

Finally a word should be added on behalf of the very small chitons. Not only are the younger stages of growth frequently quite different in appearance from the adult condition, and very insufficiently known for most of our species, but many forms are small, even when fully grown and some are so difficult to recognize with certainty in the field that the collector cannot go amiss in saving every specimen encountered. I here refer simply to the juvenals which are commonly to be found in company with the adults of the same or different species. The usually excessively minute post-larval stages are likewise of the greatest interest, but their collecting requires somewhat special methods, which will quite likely not be found exactly similar for all the species. Through the courtesy of both parties involved I am able to quote an instructive paragraph from a letter on this subject written by Dr. Harold Heath to Mr. E. P. Chace. I know of no one who has had so wide an experience in this particular field as has Dr. Heath. "I have collected hundreds of small chitons, many of them not over 1/50 of an inch in length, in the following way. In pools and from cliffs where adult and fairly well grown chitons abound I chisel off bits of stones, corallines, mussels supporting worm tubes, etc., and place these in a bucket or glass jar and place it in a dark cool place. Do not let any water remain in the bottom of the vessel; merely keep the specimens moist with the water that clings to them. After 24 hours or so the chitons will wander out from cracks they occupy and can be located with a hand lens. At first I found this pretty slow work owing to scarcity of material, but since I have located rich districts and can find at least 100 in every bucketful."

RECENT WORK ON THE LEPIDOPTERA

Doctors Barnes and McDunnough, of Decatur, Illinois, are now our leading Lepidopterists in this country. The recent Checklist of

North American Lepidoptera, the first since 1903, contains over 400 pages of names and a very carefully prepared index. There are over 8000 species, with many varieties, forms, etc. The most marked and radical changes are to be found among the *Papilionoidea* (butterflies), in fact the nomenclature is turned upside down. Then there are numerous changes in the conception of the California species, due to the study of Boisduval's types. It is to be hoped that the new arrangement will meet with general favor and use, but it can be hardly expected in certain quarters.

The Contributions to the Natural History of the Lepidoptera of North America, now in its third volume, is very valuable; Number 2, issued last December, containing the most careful and critical notes on the changes of names of many of our butterflies that has ever been done. Then the beautiful photographic illustrations are additional valuable features. Students should stop bickering over various matters now and take these results as the starting point for new work. The classification of the North American Butterflies has long been in a worse state than that of any other group of insects or of plants or animals even. It is to be hoped that this condition will be speedily changed through the careful work of Barnes and McDunnough.

FORDYCE GRINNELL, JR.

THE LIFE HISTORY OF A SWALLOWTAIL BUTTERFLY (*Papilio zolicaon* Boisduval)

The following observations were made by the author in the summer months of 1916, and are given as put down daily in his notes. The description of the larva is given as it appeared to the naked eye during its growth.

July 28, 10:15 A. M., I saw a swallowtail butterfly (*Papilio zolicaon* Boisduval) hovering over a vacant lot at Tenth and Valencia streets. I tried to capture it, when it dodged and rested for a moment on a small Anise plant (*Foeniculum foeniculum* (L.) Karst.) and then flew away. On coming near I found an egg on one of the ramifications. It was yellowish green, a perfect sphere about 1 mm. in diameter, and was stuck to the little leaf where it could be easily distinguished against the darker green of the leaf.

July 31, 8 A. M. The egg now has a brown line all around it and a brown spot on the upper apex.

Aug. 2, 10 A. M. The larva has hatched. It is 2 mm. long, purplish with a whitish spot in the middle of the back. It is covered with hair-like points. No eggshell is visible, the fore part of the larva is much thicker than the posterior.

Aug. 3, 10:15 A. M. Larva has increased to 3 mm. long.

Aug. 4, 12:35 P. M. Larva has increased to 4 mm. long.

Aug. 5, 9 A. M. Larva has increased to 4½ mm. long.

Aug. 6, 9:15 A. M. Larva has increased to 6 mm. long.

Aug. 7, 9:15 A. M. Larva has increased to 7 mm. long. I can distinctly see a row of yellow spots on both sides, right over the legs and prolegs. They are easily distinguished from the purple color of the skin. The anterior part is now of the same thickness as the posterior, having thus reduced in size.

Aug. 8, 5:30 A. M. Larva has increased to 8 mm. long.

Aug. 9, 10 A. M. Larva has increased to 10 mm. long. It is now 2 mm. in width. It eats a leaf ramification of the Anise, which is 10 mm. long and $\frac{1}{2}$ mm. wide, in 25 seconds. This is certainly astounding when compared to the eating powers of the higher animals. I see that the tubercles along the sides and back are covered with hairs, quite small and well separated. The whitish point on the dorsal part of the larva is divided and on the back proper there is no white spot.

Aug. 10, 10:45 A. M. Larva has increased to 12 mm. long.

Aug. 11, 9:15 A. M. Larva has increased to 13 mm. long. There is a row of white spots on either side, right under the row of yellow spots, on the sides of the prolegs. The head is banded with two black lines, forming an angle at the apex, and having a spot just over the mouth parts inclosed by the first two lines.

Aug. 12, 9:10 A. M. Larva has increased to 17 mm. long. When alarmed it suddenly jerks and throws out two orange yellow filaments, one longer than the other, placed just behind its head. It has now done this for about five days. The filaments now measure 2 and 3 mm. respectively. The larva now measures 4 mm. across the body.

Aug. 13, 9:45 A. M. Larva has increased to 21 mm. long.

Aug. 14, 8:45 A. M. Larva has increased to 22 mm. long.

Aug. 15, 2:30 P. M. Larva has increased to 23 mm. long. It has radically changed color. The shed skin lies in the leaves of the Anise. The new colors are: head same as last described excepting a small black spot on either side of the angular lines. Then, beginning with the thorax and going backward, there is a yellow ring, then a black ring, light blue ring, black ring, yellow ring, black ring with six orange spots, blue ring, black ring, blue ring, black with orange spots, etc. The prolegs have two black spots on the outside and the true legs have three black spots on the outside. The abdomen is white with black spots in the middle at intervals.

Aug. 16, 10:20 A. M. Larva has increased to 25 mm. long. I can now readily perceive a strong and disagreeable odor when the larva throws out its filaments. This is its manner of eating. It chooses a twig of a leaf, clutches it with its six true legs, or only four of them, clutches some other leaves with its prolegs, goes to the tip of the chosen twig and starts eating down, wiggling its head up and down, until it gets to where the twig is attached to the stem.

It then starts on another twig, going to the tip and eating downward as before.

Aug. 17, 9 A. M. Larva has increased to 30 mm. long.

Aug. 18, 9:30 A. M. Larva has increased to 35 mm. long.

Aug. 19, 8:45 A. M. Larva has increased to 40 mm. long.

Aug. 20, 9:40 A. M. Larva has increased to 45 mm. long.

Aug. 21, 9:30 A. M. Larva has not increased or changed.

Aug. 22, 9:30 A. M. Larva now lies on the top of the cage, attached by its posterior end to a little pad of silk. It has curled up somewhat and only measures 27 mm. It still has the power to throw out its filaments when irritated. It lies as a long triangle, the head part thicker than the back.

Aug. 23, 9:30 A. M. No change. 3 P. M. I saw the last stage of the larva changing into a pupa. The last part of the larval skin was on the posterior end of the pupa, which, after repeated jerks, pushed it off. The pupa was very light green, with yellow on the posterior abdominal region. It was held to the top of the vivarium by a pad of silk on its posterior end and by a silken girdle placed where the thorax joined the abdomen. The girdle was attached on both sides to the supporting top.

Aug. 24, 9 A. M. No change. Pupa measures 30 mm.

Sept. 5, 12:30 P. M. The butterfly has come out of the chrysalis. I was unable to see this done. The empty case is still attached to the top. The butterfly is a male *Papilio zolicaon* Boisduval.

During the whole life history I found only two shed skins; one when the larva radically changed color on Aug. 15th, and the other when the larva changed into a pupa. The shed skins and the butterfly are in my collection.

RAOUL M. MAY,

Los Angeles, Cal.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

Meetings

Public meeting Tuesday evening, June 5th, 1917, at 7:45 o'clock, in the Lecture Room of the Public Library, 10th floor. Mr. Raoul M. May will speak on "Fabre, the Great French Naturalist," and "The Life of a Wasp."

Geological Section. Tuesday evening, May 15th, at 7:30 o'clock, in the Music Room of the Public Library. For informal discussion of Geological Problems, with occasional short talks or lectures.

Field Trips

May 20th.

SOUTH PASADENA HILLS. Meet at Garvanza side of South Pasadena Bridge (Mineral Park) at 10 A. M. (4 miles.) Leader, Charles F. Richter. Phone 560255.

May 27th.

SOLEDAD TRAIL. Meet at P. E. depot (Main St.) at 7:50 A. M. (Glendale car.) 10 miles. Leader, Mr. Richter.

June 3rd.

EXPOSITION PARK. Meet at Museum of History, Science and Art at 2:30 P. M.

June 9th (Saturday).

PACOIMA WASH, near San Fernando. Leaving the Tally-ho Garage, First and Broadway, at 8 A. M. Leader, F. Grinnell, Jr.

Membership Committee

The Membership Committee announces the acceptance of the following as Associate Members: Miss Eleanore Parker, 533 West 51st St., Los Angeles; Miss Bertha L. Johnson, 533 West 51st St., Los Angeles; Miss Marguerite Tew, 200 East Ave. 43, Los Angeles; Mr. Ernest M. Marshall, 622 Gage St., Los Angeles.

Club Pins

More Club Pins are being ordered, as it has been impossible to supply pins to all members desiring them. If you wish one, deposit a dollar with Mr. Chace, the Treasurer. For members only.

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THE DISCONTINUOUS DISTRIBUTION OF SOME PLANTS

By Fordyce Grinnell, Jr.

A study of the present habitats of living things may tell us many facts concerning their past history and migrations. We may learn that the earth has undergone marked changes in its climatic or geological history. Those plants or animals of which we have only a few related forms scattered at remote and restricted regions of the earth are especially suggestive of an old geologic history; and a great change geologically or climatically to explain their present whereabouts. A good example of discontinuously distributed plants is found in the four species of the curious coniferous tree *Tumion* or *Torreya*. *Tumion taxifolium* is found in the extreme southeastern United States; *T. californicum* in the middle mountain region of California—the Coast Range and Sierras; *T. nudiferum* in southern Japan; and *T. grande* in northern China or Mongolia. In past geological time there were many species of *Sequoia* scattered pretty continuously over the northern hemisphere, but now there are only two survivors, found each in a limited region in California; one in the Coast Range and the other in the Sierras.

Here in Southern California we have a number of isolated plants which we do not meet with for long distances; they indicate, as a rule, a change in climatic or geologic history, or, in one, a possible planting of the seed by wind or birds. Of course there may be other and unknown factors. These discontinuously distributed plants were doubtless at one time continuously distributed between their present extreme living representatives; and in the case of one, as the *Sequoia*, between their present survivors and their fossil remains in Alaska, Greenland and other regions.

The following local plants are a few of the more interesting and striking examples to a student and should be made, together with other plants, subjects of individual thought and study.

1. *Pinus monophylla* Torr. & Frem. Nut Pine or Single-leaf Pine. One good-sized tree is found on the summit of Mt. Lowe. It has been found on no other portion of the front range of the San Gabriel mountains, but is abundant on the desert slopes.

2. *Juniperus californica* Carr. This is rather a common shrub in the Tujunga and Pacoima washes in the San Fernando valley, less so in the San Gabriel wash near Azusa. It is common on the desert side of the mountains.

3. *Myrica californica* C. & S. Wax myrtle. This has only been found in Rustic canyon, near Santa Monica. Common in the middle Coast ranges. *M. hartwegii* is found in the middle Sierras.

4. *Quercus lobata* Nee. Valley or white oak. This tree is common around Chatsworth Park and on the Santa Susanna mountains. Single trees are found at Santa Monica and Lamanda Park. It is thus seen to gradually dwindle out at its southern limit.

5. *Odostemon nevinii* (A. Gray) Abrams. Nevin's barberry. Only found in the Pacoima and Tujunga washes in the San Fernando valley. Its nearest relative, *O. fremonti* (Torr.) Rydb., is found in southern San Diego county.

6. *Odostemon fascicularis* (DC) Abrams. This has been found in certain very limited spots. On the Switzer's trail; on the divide between Millard's and Bear canyons; and in the Verdugo mountains.

7. *Svida californica* (C. A. Mey) Abrams. Dogwood. There is a large tree growing along Ballona Creek near the end of the West Adams St. car line. It is frequent in the San Gabriel, San Bernardino and San Jacinto mountains. A fossil cypress has been found in the Rancho la Brea fossil deposits, and this Dogwood, which belongs in the same life zone, probably represents a survival of that old geological period. It has also been recorded from Oak Knoll, near Pasadena.

8. *Arbutus menziesii* Pursh. Madroño. Limited groves are found on the old Mt. Wilson Trail and the Sturtevant Trail. It has also been recorded from the Santa Monica mountains. It is common in the middle Coast Range, the Santa Cruz mountains and northwards.

The last two plants are especially suggestive for thought and study. And many other plants are equally so.

THE FISHES OF THE SANTA ANA SYSTEM OF STREAMS IN SOUTHERN CALIFORNIA

By George B. Culver and Carl L. Hubbs.

We present below a list of the species of fishes occurring in the coastal streams of California from the Malibu to the San Luis Rey. These streams form what may be known as the Santa Ana System, as they contain the same species, though at present several of the streams are not connected with each other. The species are few, but the individuals are numerous.

1. *Entosphenus tridentatus* (Gairdner).

The large eel-like lamprey runs up the Santa Ana River to spawn. We found the eye-less worm-like larvae of lampreys in the mud along Los Angeles River.

2. *Notolepidomyzon santa-anae* (Snyder).

The Santa Ana Sucker was described in 1908 from specimens collected at Riverside. We have found it in Rio Hondo, Los Angeles River, and Arroyo Seco. The larger suckers in the upper San Gabriel are probably of this species.

3. *Richardsonius orcutti* (Eigenmann and Eigenmann).

The abundant southern California Minnow has been recorded from Temecula, San Luis Rey, San Jacinto, and Santa Ana Rivers, while our specimens come from Santa Ana River, San Gabriel River, Rio Hondo, Los Angeles River, Arroyo Seco, Ballona Creek, and Malibu Creek.

4. *Agosia nubila carringtonii* (Cope).

Spring minnows, apparently of this form, occur in the Santa Ana River. They can be told from the other minnows by their smaller scales and sharper snout, which projects a little beyond the mouth.

5. *Salmo irideus* Gibbons.

The steelhead trout runs into some or all of the streams of the Santa Ana System. The land-locked individuals of the mountain streams are known as Rainbow Trout.

6. *Salmo evermanni* Jordan and Grinnell.

A fine-scaled trout described from the head waters of the South Fork of the Santa Ana River.

7. *Gasterosteus cataphractus williamsoni* Girard

The smooth-sided Stickleback of the Santa Ana System is abundant everywhere.

NOTES ON AN ARMY SEEN IN MEXICO

In the interests of the U. S. Government I spent the month of March, 1917, in Mexico, most of the time on the island of Magdalena. Rumors of German submarines and Japanese activity were not the cause of my visit, and during the first part of my stay I saw no military activity.

But suddenly, one morning, in attempting to cross the island, which the previous day seemed devoid of life, I found the intervening plain teeming with life whose

"Glancing arms and helmets bright

In martial splendor—"

shone brightly in the tropical sun. By chance I had an unrivalled opportunity to watch the maneuvers of a hundred thousand soldiers strung in battle array. The soldiers had evidently lately discarded their old uniforms for new, and marched back and forth on the sandy

plain, now in close formation, elsewhere in open ranks. In places I estimated a thousand soldiers occupied a space five feet square, each crowding his neighbor. Each soldier held his arms aloft in the air, and the greatest activity prevailed.

When my presence in their midst was discovered, what a scurrying! All prepared for a masterly retreat. Some sped away to the shallow waters near by, and sought concealment beneath the decaying leaves of the mangle bushes. Others sought holes in the plain that were too close fitting—into which the soldier vainly tried to crowd himself, often with success except for his big right arm, which he had to leave outside, conspicuous in the bright sun because of its ivory whiteness! These big right arms or hands were frequently left-handed instead.

For three successive days this big army paraded up and down that portion of the island—each day displaying a smaller number of soldiers. On my last tramp across the island the grounds were deserted as at first—only here and there a dismembered leg or arm showing the tragedies of war. Some had become food for birds, others had become victims to prowling coyotes.

These brave soldiers I believe were specifically identical with others found years ago at Todos Santos Bay, Baja California, which were identified as *Gelasimus brevipes*. Some went into alcohol for the U. S. National Museum, and if not true I will try to correct the determination. Has the Fiddler Crab ever been found in Alta California?

C. R. ORCUTT,
San Diego, California.

A LOCALITY OF ARCHAEOLOGICAL INTEREST

The study of archaeology is of more or less general interest. There are few indeed who are not interested, though but slightly, in the races that, in days long gone by, sprang from and returned to this hoary old earth. Each lived here its brief hour and went its way; each serving as a step in the ladder of progress that has developed the present civilization, which soars onward, to end where? Who can doubt that in the infinite future the poor relics of our present existence will appear to the Superman even as the crude relics of the dead ages appear to us.

We search the records of the past: here a rude picture painted upon a cliff, there a bone found in a gravel bed, and slowly the story of the march through the centuries unfolds and reveals the thin thread binding us to the animal-savage of countless years ago. We find civilizations growing and decaying, and later civilizations building with the dust of the former. We read in their ruins of vast hordes who lived and loved and toiled and died; of generation succeeding generation, each growing more prolific in culture and art, and then

came, perhaps, some dire calamity and the race, as the individual, returned to dust.

In a measure, this study is like looking back through the flight of time at ourselves living under changed conditions and in different environments. What would we have been and done? How would we have lived—as king or slave?

Southern California is not very rich in relics of its aborigines. There are no great ruins of tremendous stone blocks, nor beautiful sculpturings of mystifying glyphs telling of ancient deeds or religions. In fact, the field is so barren, owing to the mental development, or lack of it, of the Indians who lived in this locality, that, except for the conventional stone and shell utensils, with a few noteworthy variations, it is seldom that relics indicative of habits are brought to light.

On the Sandberg Ranch, in the mountains south of Antelope Valley, and about four miles east of the Ridge Road, is a small canyon, in the mouth of which is situated a group of rocks indicating the site to have been a large Indian encampment. One rock has two mortar holes, about fifteen inches in depth, while there are a number in the rocks nearly as deep. On another rock a series of small indentations, looking like mortar holes just begun, forms roughly a five-pointed star, while another group remains undeciphered.

Near at hand is a large granite boulder, about eight feet high and the same distance across the base. The sloping side has been smoothed and polished apparently, and is stained with an indelible stain absolutely unlike any other rock in the vicinity. The entire monolith rests upon two wedge-shaped rocks that possibly were placed so as to lessen the pitch of the incline. It is possible that this rock, if not the others too, was used in some ceremony constituting part of the phallac worship practiced generally by the Indians of Southern California. Numerous pestles, mortars, and a few arrowheads have been found here, but no relics of burial. There are also a number of stone-lined pits near, the excavation of which reveals nothing but a small amount of charcoal. These were probably used for the storage of acorns.

A small creek runs through the camp site, which is surrounded by oaks and pines. Back in the canyon, the spruce trees mingle with maples, and in the foreground a tiny meadow reaches out to the edge of a small lake, making in all a beautiful spot.

C. P. COLLINS.

EGG-LAYING OF TESTUDO AGASSIZII

Miss Florence Evans of Sierra Madre, California, has recently sent me some interesting observations regarding the egg-laying habits of the Desert Tortoise, *Testudo agassizii*. A tortoise, of this species,

which Miss Evans kept as a pet, was found near Barstow, San Bernardino County, and taken to Sierra Madre. On June 18, 1916, this tortoise crawled into a shady place, where some weeds grew, dug a small hole and laid four eggs. Ten minutes afterward she covered the eggs with dirt and went away.

On September 18 the eggs still remained unhatched and Miss Evans sent me one of them. This egg is pure white with a thick granular, calcareous shell. It is slightly prolate in shape, being equally large at the two ends. The shortest diameter is 35 millimeters and the longest 42. The tortoise was only eight inches long and if the egg of a four-foot Galapagos Island tortoise were of proportional size it would be about nine inches in diameter instead of three, the actual dimension.

Other known tortoises with a few exceptions bury their eggs in the earth and some times tamp the disturbed soil down hard and smooth by raising the hinder part of the body and letting it fall heavily on the soft dirt. (See Hutton, Journ. Asiatic Soc. Bengal, 6, 1837, p. 689.)

CHAS. L. CAMP,
American Museum, New York.

A RARE AND INTERESTING WASP

Last summer, when in company with Mr. G. P. Engelhardt of Brooklyn, N. Y., on a day's trip in the mountains back of Pasadena, three specimens of *Vespa sulphurea* workers were taken. This wasp was not before represented in the Brooklyn or New York collections.

The nesting habits are unknown and a knowledge of them is very much desired. Nests are built underground, above ground, on bushes, weeds or grass or high up in branches of trees. *V. sulphurea* is one of three of our species of *Vespa* whose nesting habits are unknown. The closely allied *Vespa carolina* builds the nest underground. This problem will be investigated next year, as well as collecting specimens of the queens and males.

F. GRINNELL, JR.,
Pasadena, California.

ANNOUNCEMENTS OF THE LORQUIN NATURAL HISTORY CLUB

Geological Section, Tuesday evening, June 18th, at 7:30 o'clock, in the Music Room of the Public Library. Mr. E. E. Hadley is in charge of the geological work of the Club, and will be glad to correspond with anyone interested in the subject. Address 123 So. First St., Alhambra, Cal.

The Club will meet in the Lecture Room of the Public Library Tuesday evening, July 3rd, at 7:45 o'clock. Prof. J. Z. Gilbert will speak on The History of the Rancho La Brea Fossil Deposits. The public is invited.

Mr. A. W. Lindsay, Iowa City, Ia., and Mr. Kendall F. Thurston, 724 South New Hampshire Ave., Los Angeles, have been accepted as Associate members of the Club.

Field Trips

June 10th.

SAND DUNES, PLAYA DEL REY. Take 7:35 a. m. Redondo Beach via Playa del Rey car, leaving from Pacific Electric Hill St. Station. Buy round-trip ticket, 50c. Walk about nine miles. Canteens. Leader Knox Hagar.

June 16th (Saturday).

BAIRDSTOWN HILLS. Take Sierra Vista car leaving P. E. Main St. station at 9:30 a. m. 10c each way. Meet at 10 o'clock on Titus Ave., Bairdstown, where Prof. Gilbert has kindly offered to take charge of those Club members desiring to investigate the geological resources of the vicinity.

June 17th.

No scheduled trip.

June 24th.

VERDUGO PEAK. Meet at P. E. Main st. station at 6:40 a. m. Take 6.46 Glendale car for Verdugo Park. Round trip, 35c. About eight miles. Leader, Paul D. R. Rüthling.

July 7th-8th.

SWITZER'S CAMP, ARROYO SECO. Two parties will leave on Saturday, the 7th. The first party, Charles F. Richter, leader, will take the 7:41 Pasadena Short Line car from the P. E. Main St. station. The second party will take the Pasadena Short Line car leaving the Pacific Electric Main St. station at 1:31 p. m. Special Club meeting at Boulder Lodge Saturday evening. Arrange with Route Committee, Charles F. Richter, Chairman, for overnight accommodations at Switzer's Camp. Meals 50c at camp. Plans for Sunday trip to start from the Camp will be arranged later. For information, telephone Richter, Home Phone 560255.

July 15th.

FISH CANYON. Take 8:00 a. m. Monrovia car from P. E. Main St. station. Trail to Fish Canyon about eight miles. Leader, Adele Schmidt.

It will be of more than passing interest to those having a taste for botany to learn that the Trustees of Leland Stanford Jr. University have agreed to finance the publication of an Illustrated Flora of the Pacific Coast, somewhat on the plan of Britton and Brown's Illustrated Flora of the Eastern States. The work will be published in four volumes, and 6000 species or more will be figured.

NOTES

The Route Committee for Field trips consists of the following members: Charles F. Richter, Chairman, Adele Schmidt and Knox Hagar. Suggestions for the conduct of field trips will be gladly received.

Mr. Allyn G. Smith has accepted a position with the San Joaquin Light and Power Corporation at Fresno, Cal. In a note to the Editor he expresses a continued interest in the Lorquin Natural History Club. His address is 1238 O St., Fresno, Cal.

At the meeting of the Geological Section on May 15th, Prof. J. Z. Gilbert gave a very interesting talk on the Pleiocene formation underlying a part of Los Angeles. Some fossil fish from the Monterey shales of Los Angeles and Alhambra were shown and commented upon.

FOR SALE, WANTS AND EXCHANGES

LORQUINIA LINERS are read by scientists everywhere, scientific institutions and private collectors. Rates in advance. $1\frac{1}{2}$ cents a word, minimum charge 25 cents. Advertising Manager, 1051 West Twenty-third Street, Los Angeles, California.

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LORQUINIA

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OUR FOURTH ANNIVERSARY

Lorquinia is now one year old, and the Lorquin Natural History Club is about to enter into the fifth year of its existence. Since August 1913, when nine school boys and one adult gathered together at the first regular meeting of the Lorquin Natural History Club and adopted its constitution and laws, many changes have taken place. The Club passed through acute stages in its development when its very existence was in danger, but meetings have been held regularly on the first Friday of every month since August 1913, and at only two of these meetings were there too few to form the quorum of more than one half of all the "Active Members" necessary (until the constitution was amended in June of this year) to transact business.

The law which has always been in effect with regard to dropping "Active Members" not interested enough to attend meetings regularly has just been made more stringent as applied to Directors, so that they loose their position in the Club by absence of three instead of five successive meetings. This law has always successfully eliminated from the Club such elements as would tend to retard our progress and has contributed greatly to bring us to our present size and activity.

Because of the rapid growth of our Club, there are many members who have not yet become familiar with the management and operation of Club affairs. Not only for ourselves, but also for others who may question us, it is our duty to inform ourselves, no matter to which class of members we belong, about everything concerning the Club, so that during the coming year we may all be more useful members better able to assist each other in the Club's purpose of stimulating interest in the study of natural history so that great ends may be attained thereby. For this reason, it is thought that at this opportune time Lorquinia can devote a number to explaining to members and outsiders much that has not been clear and still more that has not been known at all.

We must all unite and strive to make the fifth year exceed the fourth year in Club growth and accomplishments as each year so far has surpassed the one preceding. The more we can do, the more there is to be done.

**THE WHEN AND HOW OF CLUB ACTIVITIES—SOME
GENERAL INFORMATION****Purpose**

The Club aims to further the study and diffusion of knowledge of natural history, especially of the Southwest.

Publication

Lorquinia is issued on the second Friday of each month for the purpose of recording observations of scientific value and to further the aims of the Club. Members dues cover cost of subscription to *Lorquinia*. Upon request, extra copies of current *Lorquinias* are provided free to members. The Publication Committee, which has direct charge of the paper, solicits criticism and advice from the members in general.

Library

Students are urged to make use of the rapidly accumulating quantity of scientifically valuable published information that is constantly being received by the Club. The library contains many government publications, books, pamphlets and periodicals issued by the leading scientific institutions of this and other countries. Members are at liberty at any time to borrow books or other works from the Club Librarian, Raoul M. May, who takes pleasure in assisting students in finding useful literature in special branches of natural history study.

Meetings

The monthly Club Meeting is held on the first Tuesday evening of each month at 7:45 o'clock in Los Angeles, as announced in *Lorquinia*. Members are invited to bring friends and visitors interested in natural history. A lecture or two arranged by the Program Committee form the main part of the program. Informal discussion and questions follow and specimens are exhibited. Members having anything of interest to tell the Club speak briefly on various topics, important announcements are made and the meeting is adjourned.

Special Meetings are called by the President usually for business of importance or for special numbers arranged by the Program Committee, and are generally for members only.

Directors' Meetings are principally for the transaction of all Club business. These meetings are held on the first Friday evening of each month at 7 o'clock in the homes of members, as announced by post card. Associate Members are welcome to attend, but the number is of necessity limited and Associate Members must first request invitations from the Membership Committee or from some Director. These meetings are for members only.

The Geological Section was organized among the members by

E. E. Hadley. Interesting informal discussions are held and specimens are exhibited at the meetings, which are presided over by Chairman Mr. Hadley, and announced in *Lorquinia* for the third Tuesday of each month. Enthusiastic geologists are advised not to miss these meetings.

Members

The Directorate is self perpetuating, as explained in the Club Constitution, and is chosen from the membership. They transact all the business of the Club.

Associate Members are chosen from outsiders who are interested either in natural history or in the work of the Club. Their acceptance or rejection rests entirely with the Membership Committee, which, however, has adopted the method of submitting all applications at the Directors' Meetings for the approval of the Club, so that members have the opportunity of stating their opinions of undesirable applicants before the Club or in private to the Committee.

Honorary Members and Ex-active Members are described in the Club Constitution.

Field Trips

Field trips are arranged by the Route Committee for almost every week. These trips are for the purpose of collecting, and learning to appreciate the numberless diversions that Nature provides for the sympathetic lover of the great out-doors. Suggestions and criticisms are invited by Charles F. Richter and Adele Schmidt, who now comprise the Route Committee and desire to serve the best interests of the Club. Records of the trips are kept by the committee. Outsiders are cordially invited to attend trips not designated in *Lorquinia* as being for members only.

Club Photograph Album

This photograph album consists of a collection of pictures dealing with the activities of Club members and various lines of study followed by them. In it may be obtained at a glance an accurate impression of many rare and characteristic faunal and floral features of the Southwest. The album is in the care of the Secretary, who solicits good photographs taken by the members and of a valuable and interesting kind.

Club Emblem and Colors

The four-petaled California Poppy with the four Club initials, one on each petal is the emblem used on membership cards and Club pins. The gold-filled pins of the poppy design may be obtained only by members, and can be purchased from the Treasurer for \$1 each.

The Club colors are red, yellow and black, an arm band of these colors being used to designate field trip leaders. The colors

are found in the markings of the Coral Snake (*Elaps*) of the Southwest, and are also common to certain butterflies and other animals of the region.

Lorquin

The Lorquin Natural History Club derives its name from Pierre Joseph Michel Lorquin, a pioneer California naturalist, who was born at Valenciennes, France, in 1797. An ardent naturalist and expert lepidopterist, Lorquin came to America to establish himself in California in 1849. Though beset with financial difficulties and confronted with hardships almost all of his life, his enthusiasm as an explorer and scientist earned him fitting honors and enriched science greatly. Lorquin died in 1873. A complete life of Lorquin may be obtained from the Club Librarian. It is a free translation from the French and is well worth reading.

Plans for the Future

There are many new ideas being developed in the minds of the members; but as they do not consider it wise to talk too much about things that, at the present time, are impossible of attainment, they prefer to devote their energies to improving past attainments and assuring the permanency of present accomplishments while quietly perfecting meanwhile plans that will mean much to the growth of the Club when the time is right for them to mature.

CONSTITUTION OF THE LORQUIN NATURAL HISTORY CLUB

(Revised June, 1917)

ARTICLE I.

Section 1. This organization shall be known as the Lorquin Natural History Club.

ARTICLE II.

Section 1. The object of this Club is to promote the study of all branches of natural history.

ARTICLE III.

Section 1. There shall be four classes of members: Directors, Honorary Members, Ex-active Members, and Associate Members.

Sec. 2. A Director is one who attends meetings regularly and takes an active interest in the Club.

Sec. 3. An Honorary Member is one who is distinguished in some branch and takes or has taken an interest in the Club.

Sec. 4. An Ex-active Member is a member who, having been a Director, but no longer being able to attend meetings, still maintains an active interest in the welfare of the Club and pays the regular dues.

Sec. 5. An Associate Member is a member who need not attend meetings regularly and is not required to take an active part in the work of the Club. He cannot vote in the Club, but must pay dues equal to those paid by Directors.

Sec. 6. The Board of Directors (originally having comprised "Active Members," analogous to Charter Members) shall be self-perpetuating.

To be elected a Director, one must be proposed and be present at the Directors' meeting preceding the Directors' meeting at which he is to be voted upon.

Sec. 7. Two votes cast against a candidate for Director shall bar him from directorship in the Lorquin Natural History Club.

Sec. 8. To be elected an Honorary Member necessitates a unanimous vote of the Directors present at any Directors' meeting.

Sec. 9. Any person from whom the Club accepts a yearly contribution of at least \$1.50, payable from the time of the nearest semi-annual meeting and yearly thereafter, may become an Associate Member with privileges granted by the Membership Committee to such members.

Sec. 10. Prospective members are neither to be proposed nor voted on at any but Directors' meetings.

Sec. 11. The Board of Directors shall consist of not to exceed twenty members.

ARTICLE IV.

Section 1. In the Lorquin Natural History Club there shall be a President, Vice-President, Secretary and Treasurer.

Sec. 2. It shall be the duty of the President to preside at the meetings.

In the absence of the President, the Vice-President shall take his place.

It shall be the duty of the Treasurer to guard the financial interests of the Club to the best of his ability, and, in the absence of all other officers, the Secretary presides at the meeting.

Sec. 3. The four officers shall be elected at the October meeting and hold office for one year.

ARTICLE V.

Section 1. There shall be Directors' Meetings, Club Meetings and Special Meetings.

Sec. 2. Directors' Meetings shall be held at seven p. m. on the first Friday of each month.

Club Meetings shall be held on the first Tuesday evening of each month.

Special Meetings shall be called at the option of the President. (Field and other meetings are arranged by committees.)

LORQUINIA**ARTICLE VI.**

Section 1. There shall be a Program Committee of three (appointed by the President each October) whose duty it is to provide a lecture, talk or reading of not less than four minutes at each regular meeting; and the member at whose home the meeting is held shall give a short talk on the work he is doing.

Sec. 2. There shall be a Publication Committee of three members, to have absolute control of the Club periodical, Lorquinia, and all money derived therefrom. One of this committee shall be the editor, appointed by the aforesaid committee and whose duty it shall be to edit Lorquinia.

Sec. 3. The three members of the Publication Committee shall be elected by the Club for a term of one year. The successor to fill a vacancy on the committee shall be elected by the Club.

Sec. 4. There shall be a Membership Committee of three members, whose duty it shall be to make rules governing admission, retention and privileges of Associate Members. Members of this committee are to be chosen according to the method described in the preceding section.

Sec. 5. No rule made by either of the two above committees may be made to conflict with the Club Constitution and By-Laws or with Roberts' Rules of Order, as applied to the conduct of meetings of the club.

Sec. 6. Any or all of the members serving on either of the two above committees may be recalled by a four-fifths vote at any Directors' Meeting.

ARTICLE VII.

Section 1. This Constitution may be amended by a two-thirds vote of the Directors present at any Directors' Meeting in March, June, September or December, if the proposed amendment be written and handed to the Secretary, and if it be moved and seconded at a meeting preceding that of its adoption or rejection.

BY-LAWS

1. Any Director absent from three consecutive Directors' Meetings shall be dropped from the rolls of the Directors.

2. Directors who are sick or who have a leave of absence are exempt from the penalty prescribed by By-Law No. 1.

3. A leave of absence for not more than one year may be granted by a two-thirds vote of the Directors present at any Directors' Meeting.

4. A member may be suspended by a two-thirds vote of the Directors present at any Directors' Meeting.

5. The Lorquin Natural History Club shall be governed by Roberts' Rules of Order when they do not conflict with the laws of the aforementioned Club.

6. The dues shall be \$1.50 per year, to be collected by the Treasurer as follows: 75 cents at the October meeting and 75 cents at the March meeting. Associate Members shall pay \$1.50 annually as stated in Article III.

7. Any member in arrears for five consecutive months shall be dropped from the rolls.

8. A quorum shall consist of more than half of the Directors not on leave of absence.

9. The President shall endeavor to arrange field trips and appoint committees to have charge of the same.

THE NERITINA OF HAWAII

There are three species of Neritina found on the island of Hawaii: *N. granosa* Sby, *N. cariosa* Gray, and *N. tahitensis* Less. (*N. vespertina* Meth.).

N. granosa lives entirely in fresh water. It can be collected in almost all of the numerous streams of the windward coast. It is not very variable. It lives on smooth stones, generally in colonies. In swift water the shells have no moss upon them, but in calm, deeper water they are nearly always coated with a growth of green algae. I have collected them by diving for them in as much as ten feet of water, although most of them are found near the five foot level.

N. cariosa is distinctly an inhabitant of brackish water. I have collected it in a few localities with *N. tahitensis*, but never with *N. granosa*. It is very plentiful in isolated ponds of brackish water along the coast. Like *N. tahitensis* it is often much corroded, while *N. granosa* is never corroded in the least.

N. tahitensis is more limited in the number of localities in which it is found than the other two. I have collected it with both the other species. It is most plentiful in a large pond of fresh water where it grows to perfection on the under surfaces of loose rocks. They immediately release their hold upon a rock when it is removed, but the other two species, especially *N. cariosa*, stick very tightly to the object they are upon.

The Hawaiians use all three species for food, boiling them and eating them with salt. I once sampled a *Neritina granosa*, but found it very unpalatable.

THEODORE DRANGA,
Hilo, Hawaii.

ANNOUNCEMENTS L. N. H. C.

The Club will meet in the Lecture Room of the Public Library Tuesday evening, August 7th, at 7:45 o'clock. Mr. Charles F. Richter will give A Lesson in Plant Classification, and Mr. Donuil Hillis will speak on "Alkaloids." The public is invited.

The Geological Section will meet in the Music Room of the Public Library Tuesday evening, July 17th, at 7:30 o'clock. All interested persons are cordially invited.

NOTES

The new edition of the Flora of Los Angeles and Vicinity, by Prof. L. R. Abrams, of Stanford University, is a handy, pocket-size volume of 432 pages. The keys to both genera and species make it much more convenient in use than the old edition, and the book will fill a place that has been vacant for some time.

At the meeting of the Botanical Section of the Southern California Academy of Sciences, June 28th, Prof. L. R. Abrams gave a very interesting talk on The Possibilities and Opportunities for Botanical Study in Southern California. We hope to give a synopsis of his remarks in a future issue.

We call special attention to the articles by President Rüthling on the Club and its activities. Especially would we like to note the growth in membership from 20 last August to 77 at the present time. The Club should have 200 members within the next year.

TRIPS FOR JULY-AUGUST

July 22nd—No scheduled trip.

July 29th—Mts. Lowe and Wilson. Meet P. E. Main St. station at 7:30 a. m.; take Pasadena car 7:41 a. m. Seventeen miles or shorter for those returning by Mt. Lowe trails or cars. Fare, complete trip, 45c. Leader, Chas. F. Richter.

August 5th—Flintridge and Devil's Gate. Meet P. E. Main St. station, 7:30 a. m.; take Pasadena car 7:41 a. m. Five miles. Leader, Adele Schmidt.

August 12th—Santa Anita Canyon. Meet P. E. Main St. station, 7:45 a. m.; take car at 7:55 a. m. Round trip ticket to Sierra Madre, 50c. Twelve miles. Leader, Adele Schmidt.

Members are urged, during the remainder of the summer, to bring a canteen or other vessel for holding water on club trips, as most of these trips lie at least in part over mountain ridges where no water is to be had.

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SURVIVORS

THE GINKGO, OR MAIDENHAIR TREE

E. E. Hadley

There are some forms and types of animal and plant life that are of special interest to the naturalist, and particularly to the paleontologist. They are those which, their race having passed its culmination in some remote period, when they flourished in great numbers and enjoyed a wide range of distribution, have survived the climatic, or other conditions, which caused the extinction of their earlier contemporaries, but now find themselves verging toward extinction, and confined to a very limited geographical range, while the fossil remains of their ancestors and near allies of former ages are found in widely separated regions.

Though these old-fashioned forms seem strangely out of place among those of later origin, yet through their survival they have brought to us some very interesting and important chapters in geologic history. They serve to link the past with the present, and many facts are preserved which otherwise would have been lost.

There are many examples of this kind among both plants and animals. One of the most peculiar and interesting is that of the *Ginkgo* or Maidenhair Tree. To this genus is attached much of interest as being the only surviving member of a group that was once very abundant, and represented by a number of species with a wide geographical distribution. The only existing species, *Ginkgo biloba* Linn. (*Salisburia adiantifolia* Smith), commonly called Maidenhair tree, is a native of China. It is not known in the wild state and its preservation from extinction is probably due to its having been regarded as sacred by the Chinese and preserved by them in the groves around the temples.

It was introduced into the United States early in the nineteenth century, is grown to some extent in Southern California, but is much more common in some of the eastern cities. In Washington, D. C., it has been planted extensively as a street tree.

The seeds are borne in plum-like drupes which are yellowish brown in color and have a very offensive odor. For this reason, the tree being mostly dioecious, male specimens are usually planted when intended for ornamental or street trees. The kernels of the nut-like

seeds have a sweetish taste and, when roasted, are much prized by the Chinese as an article of food.

The Ginkgo was formerly regarded as belonging to the order Coniferae, but is now referred to the new order Ginkgoaceæ. It has some characteristics in common with the conifers, being gymnospermous and the cell structure of the wood is very similar, but it differs in having a large central pith. Its nearest kin is probably the Cordaitales, a family now extinct, but which was very common in the forests of the carboniferous age. The fossil wood of these plants is found in the Upper Coal Measures with the cell structure very perfectly preserved.

The character of the foliage of the Ginkgo seems to indicate a relationship to the ferns and their allies. The leaves are fan-shaped and have a general resemblance to those of the maidenhair fern, while the venation is similar to that of certain ferns. The veins radiate from the petiole, forking as they approach the margin of the leaf. There are also a number of veins which spring from the lateral margins and extend into the leaf-lobe. The leaves are wedge-shaped with considerable variation. Many are two-lobed, some are cleft very deeply, others only slightly, while many show no trace of dissection. By their peculiarities they are readily recognized when found in the fossil state.

The order Ginkgoaceæ is believed to have had a wide range of distribution during Mesozoic time, particularly the Triassic and Jurassic periods when it seems to have reached its culmination, and when a very equable climate prevailed and when gymnospermous trees were dominant in the forests. There is strong evidence that the range in time extended into the Carboniferous age, the fossil leaves having been reported as numerous in the coal-beds of that period.

The nut-like fruit of the Ginkgo very closely resembles the fossil nut *Trigonocarpus* which is often found in the coal-beds of the Carboniferous. These fossil nuts are supposed to be the fruit of the Cordaites, as they are found with the carbonized foliage and wood of that plant. These nuts are much larger than the Ginkgo seed but have the same general character.

Though now confined to China in its natural habitat the Ginkgo seems to have survived in America as late as Tertiary time. F. H. Knowlton, in his Catalogue of Cretaceous and Tertiary Plants, has listed specimens representing several species from Mississippi, Montana, Wyoming, Vancouver Island, and several localities in British Columbia and Canada. They have been reported from John Day Basin in Oregon and they also occur in many parts of Europe and in Siberia. According to Scott, "The sum of fossil evidence is of sufficient weight to prove the great antiquity of the gymnospermous family now represented by the maidenhair tree, * * * which appears to be regarded as the one surviving member of an ancient stock derived from the same cycle of affinity as the Paleozoic Cordaitæ once the dominant type of Gymnosperms."*

**DIRECTIONS FOR COLLECTING AND PRESERVING
OPHIUROIDS OR BRITTLE STARS**

Ophiuroids or Brittle Stars have not received the attention of collectors on this coast as much as they should. This is probably due to the belief that they are hard to find and, when found, harder to preserve in a satisfactory condition. When properly collected and preserved, however, they may be kept in perfect condition either as wet or dry specimens, and will make fascinating subjects for observation under binocular or other microscopes.

The collector should carry a little magnesium sulphate, Epsom's Salts, and mix it with sea water in the proportion of about two heaping teaspoonsfuls to a quart. The brittle stars should be placed in this mixture as quickly as possible and kept in it for a couple of hours or until the laboratory is reached. Here they should be transferred to a pan of cold corrosive sublimate and their arms or rays, adjusted in the desired position. After two or three minutes in this fluid they may be placed in seventy per cent alcohol, if wet specimens are desired. If they are to be dried, however, they should go in to the following preservative and remain in it for one or two days, when they may be taken out and dried.

95% alcohol	1000 cc.
Glycerine	1000 cc.
45% formaldehyde	35 cc.

Two species of brittle stars are very common on the rocky beaches of this southern coast, the serpent star, *Ophioderma panamensis* Lutken, and the worm star, *Ophionereis annulata* Le Conte. These are to be found under the rocks of the littoral zone.

During storms quantities of kelps and seaweeds are torn loose from the ocean bottom and later are cast up on the beaches. The holdfasts of these plants are the homes of many species of brittle stars, as well as innumerable other animals.

In handling brittle stars of all sorts it is better not to try to pick them up with the fingers. Let them crawl onto a kelp leaf or piece of seaweed and then drop into the fluid.

This article has been written in the hope that these beautiful marine animals will find a larger place in the collections of naturalists who have access to our beaches.

PERCY SPENCER BARNHART,
Curator, Scripps Institution for Biological Research.

THE EXTINCT VOLCANO SOUTH OF POINT LOBOS

M. J. Becker

With a good companion and a very pleasant day, I had an interest-

LORQUINIA

ing walk along the volcanic shore between Highland and Point Lobos, south of Carmel. Striking the coast about midway between the places named we came to the lower end or southern part of the ancient volcanic eruption which produced Carmel Bay and the elevation of the Monterey Peninsula. The rocks at this place lie at various angles, caused by some terrific explosion during the long ago. Some of the beautifully stratified sandstones now have a vertical position, while other masses of great blocks and ledges are inclined in various other directions.

At one place the perpendicular rocks have open spaces where the waves washed out the softer rock between them, some for a distance of 50 or more feet, and 30 to 35 feet in height. Further along we found conglomerate superimposed on the earlier sandstone ledges. Some of these ledges have the appearance as if the pebbles and cobblestones were thrown out on the sand in which they were from time to time imbedded. Later strata show more cobblestones, and a still later formation shows the stones mixed with scoria. This latter formation is seen further along the coast in great masses now greatly eroded. The conglomerate has the appearance also of a final cataclysm or outburst of volcanic fire which burnt and melted the exposed surface of the conglomerate. All this, however, took place at a greater elevation in the geological ages of the past.

A very interesting block of sandstone shows the marks or footprints of some creatures as they passed over the soft sand at an earlier geological epoch. Also some fossilized caprolites, one of which I secured.

Pacific Grove, Cal., June 16th, 1917.

MEMBERS OF THE LORQUIN NATURAL HISTORY CLUB AND THE OBJECTS IN WHICH THEY ARE INTERESTED

Directors

Bonnot, Paul, Los Angeles, Cal. Reptiles, general natural history.

*†Chace, Emory P., Los Angeles, Cal. Conchology.

Davis, Alonzo, Pasadena, Cal. Coleoptera.

Elwin, Robert, Los Angeles, Cal. General natural history.

†Grinnell, Fordyce, Jr., Pasadena, Cal. Lepidoptera, general natural history.

†Hadley, E. E., Alhambra, Cal. Paleontology, geology.

Hillis, Donuil, Los Angeles, Cal. General natural history.

Klotz, Herman, Los Angeles, Cal. Entomology.

Malcolm, Geo. E., Los Angeles, Cal. Entomology (lepidoptera).

May, Raoul M., Los Angeles, Cal. Hymenoptera and insects in general.

*Moxley, Geo. L., Los Angeles, Cal. Botany.

Little, Luther, Sierra Madre, Cal. Small mammals and ornithology.

Lytle, Rowland, Los Angeles, Cal. Herpetology, general natural history.

Richter, Chas. F., Los Angeles, Cal. Botany, astronomy.

*Rüthling, Paul D. R., Los Angeles, Cal. Herpetology and general natural history.

Shattuck, Charles, Los Angeles, Cal. General natural history, birds.

Towne, Stuart S., Los Angeles, Cal. Botany.

Officers for 1917

President, Paul Rüthling; Vice-President, Donuil Hillis; Secretary, Charles Richter; Treasurer, E. P. Chace.

—*Publication Committee. †Membership Committee.

Ex-Active Members

Cuzner, James, Belmont, Cal. Collector of lepidoptera.

Olds, Reginald, U. S. Navy. Microscopist and lepidopterist.

Patton, Stanley F., U. S. Army. Grasses and sedges.

Smith, Allyn G., Fresno, Cal. Conchology.

Waller, H. B., Los Angeles, Cal. Geology.

Associate Members

Aims, Miss Edith M., New York, N. Y. General natural history.

Alexander, Mrs. A. L., Pasadena, Cal. General natural history.

Atsatt, Miss Sarah R., Los Angeles, Cal. Birds, reptiles, amphibians and general natural history.

Barbieri, Mr. J. A., Pasadena, Cal. Archæology.

Barnes, Dr. William, Decatur, Ill. Lepidoptera of North America.

Barnhart, Percy Spencer, Scripps Institution for Biological Research, La Jolla, Cal.

Beardsley, Mr. R. L., Los Angeles, Cal. Exploration and collecting in the Sierra Nevada Mountains.

Berry, Dr. S. Stillman, Redlands, Cal. Chitons, all West American forms. Biophotogenesis. Genus Iris.

forms. Biophotogenesis. Genus Iris.

Bridge, Dr. Norman, Los Angeles, Cal. General natural history.

Camp, Mr. Chas. L., New York, N. Y. Herpetology, paleontology, geological distribution.

Chase, Percival, Los Angeles, Cal.

Collins, Mr. Chester P., Voltaire, Cal. General natural history, Indian relics.

Comstock, Dr. J. A., Los Angeles, Cal. Lepidoptera.

Conrad, Miss Frances G., Los Angeles, Cal. Botany.

Culver, Mr. Geo. B., Los Angeles, Cal. Zoology.

Denenholz, Dr. Aaron, New York, N. Y. General natural history.

Dickerson, Miss Mary Cynthia, New York, N. Y. Herpetology.

Dickerson, Mr. Roy E., San Francisco, Cal. Paleontology, geology.

LORQUINIA

- Drain, Mrs. J. H., Los Angeles, Cal. Conchology.
- Dranga, Mr. Theodore, Hilo, Hawaii. Conchology.
- Duncan, Mr. H. M., Los Angeles, Cal. Geology.
- Edwards, Dr. Chas. L., Los Angeles, Cal. Nature.
- Engelhardt, Mr. G. P., New York, N. Y. Insects, amphibians, etc.
- Fairchild, Prof. Herman LeRoy, Rochester, N. Y. "All the universe."
- Ferreira, Mr. J. M., Calexico, Cal. Botany, general natural history.
- Fox, Mr. Chas. L., San Francisco, Cal. Lepidoptera.
- Gilbert, James Z., Los Angeles High School, Los Angeles, Cal.
- Grinnell, Dr. J., Berkeley, Cal. Geographical distribution of vertebrate animals.
- Hadley, Mrs. M. E., 123 So. 1st St., Alhambra, Cal.
- Hagar, Mr. Knox, San Jacinto, Cal. Chemistry, general natural history.
- Hart, Mr. Cecil, Montebello, Cal. Botany, herpetology.
- Heede, Mr. C. J., New York, N. Y. The fresh water aquarium and its inhabitants, particularly tropical fish.
- Henderson, Dr. Junius, Boulder, Colo. Conchology.
- Henry, Dr. Leroy, Los Angeles, Cal. General natural history, hiking.
- Hepper, Mr. Alfred B., New York, N. Y. General natural history.
- Hillman, Dr. Henry, Los Angeles, Cal. Coloration of plants and animals. Chemistry and general natural history.
- Houghton, Dr. Arthur D., Los Angeles, Cal. Begoniaceæ.
- Howland, Mr. Adelbert F., Los Angeles, Cal. Butterflies.
- Hubbs, Mr. Carl L., Chicago, Ill. Fish and herpetology.
- Johnson, Mrs. Bertha L., Los Angeles, Cal. General natural history.
- Kincaid, Prof. Trevor, Seattle, Wash. Entomology, sea life.
- Lewis, Mr. W. Scott, Krotona, Hollywood, Cal. Botany, mineralogy, astronomy.
- Lindsay, Mr. A. W., Iowa City, Ia. Lepidoptera.
- Lougheed, Mr. H. E., South Pasadena, Cal. General natural history.
- Marshall, Mr. Ernest M., now with British Army. Theoretical and applied chemistry, general natural history.
- Meek, Mr. Emmett, Los Angeles, Cal. Lepidoptera.
- Paulus, Miss Gertrude, Los Angeles, Cal. Reptiles, general natural history.
- Parker, Miss Eleanore, Los Angeles, Cal. General natural history, butterflies.
- Piazza, Mr. Enrico, Los Angeles, Cal. Lepidoptera.
- Possoms, Miss Augusta C., Los Angeles, Cal. General natural history, the Club.
- Richter, Mrs. Lillian, Los Angeles, Cal. General natural history.
- Richter, Miss Margaret R., Los Angeles, Cal.

- Rüthling, Mrs. C. D., Los Angeles, Cal. General natural history.
Schmidt, Miss Adele, Los Angeles, Cal. General natural history.
Smiley, Mr. F. J., Los Angeles, Cal. Botany.
Streeter, Mr. William A., Los Angeles, Cal. Conservation, general natural history.
Tew, Miss Marguerite, Los Angeles, Cal. Geology.
Thurston, Mr. Kendal, Los Angeles, Cal. General natural history.
Woods, Mrs. Nanno, Glendale, Cal. General natural history.
Yens, Mr. Karl, Los Angeles, Cal. General natural history.

How many of the above members do you know? If you are not already a member, write to the Lorquin Natural History Club, Los Angeles, today for an application blank. If you are interested in the study of natural history and wish to join us in striving toward our ideals, we shall look forward with pleasure to seeing your name included as one of us in the list of members published next year.

FIELD EXCURSIONS

Aug. 19th. Pacoima Wash. Take San Fernando stage leaving the Tally-Ho Garage, 1st and Broadway, at 8:45 A. M. F. Grinnell, Jr., Leader.

Aug. 26th. Canyon on Trail to Verdugo Peak. Take 6:45 A. M. Glendale car from P. E. Main St. Station. Two or three miles. Leader Paul Rüthling.

Sept. 2nd. No scheduled trip.

Sept. 9th. Los Angeles River Bottom. Meet at North Broadway Bridge at 7:50 A. M. Leave at 8 o'clock. Leader, F. Grinnell, Jr.

Sept. 16th. No scheduled trip.

NOTES

A concrete example of the scientific misinformation frequently passed out to the public exists on one of our down-town business streets. In front of a certain store there is a fine specimen of *Euphorbia splendens* bearing a placard with this legend: "This very rare plant is called 'The Thorn of Christ,' native of Jerusalem, of the cactus family." All of which would be very interesting if it were true. However, it is *not* a very rare plant, being frequently found in cultivation; it is *not* a native of Jerusalem—in fact persons who have been in Palestine tell me it is not found there at all,—but its native habitat is the Island of Madagascar, off the southeast coast of Africa; it is *not* a member of the cactus family, but of the great Euphorbia family to which belongs the Poinsettia and some other strikingly beautiful, as well as many inconspicuous plants.

The Membership Committee announces the following new members: Mr. Percy Spencer Barnhart, Curator Scripps Institution for Biological Research, La Jolla, Cal.; Mrs. M. E. Hadley, 123 So. First St., Alhambra, Cal.; Mr. Percival Chase, Los Angeles, Cal.; Miss Margaret R. Richter, 801 So. Kingsley Drive, Los Angeles, Cal.; Mr. James Z. Gilbert, Los Angeles High School, Los Angeles, Cal.

ANNOUNCEMENTS

The regular monthly Club Meeting will be held in the Lecture Room of the Public Library Tuesday evening, Sept. 4th, 1917, at 7:45 o'clock. Members are urged to be present. Visitors welcome.

The Geological Section will meet in the Music Room of the Public Library Tuesday evening, Aug. 21st, 1917, at 7:30 o'clock. All interested in Geology are invited.

A Botanical Section has been organized under the chairmanship of Mr. Stuart S. Towne. The next meeting will be held at the Arroyo Seco Branch Library Wednesday evening, Aug. 22nd, at 7 o'clock. All interested members of the Club and their friends are urged to be present. Take South Pasadena or yellow Garvanza cars on Main St. to the intersection of Pasadena Ave. and Marmion Way.

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SOME FEEDING HABITS OF THE DESERT ROUGH-SCALED SWIFT

(*SCELOPORUS MAGISTER*, Hallowell)

Far out on the wide reaches of the bright Mojave Desert, the Desert Rough-scaled Swift pursues the manifold activities of his life as he scampers about on the tall tree-yuccas that stretch their sun-baked arms and point their spiny fingers aimlessly at many points of the almost perpetually blue sky. Here he hides from the terrific heat of the mid-day sun, coming forth in the mornings and evenings to earn his living, to associate with other lizards and to eye the world intelligently with the two little beady black orbs that glance sharply from the sides of his powerful blunt head as he lies where he allows the steady rays of the strong sun to beat his rough-scaled body and fill him with pent-up activity that displays itself with characteristic suddenness in many desert animals. In the winter, the Desert Rough-scaled Swift is not to be seen abroad, because snow whitens the landscape of the desert places and the nights are bitterly cold.

During June of 1916, as noted in *Lorquinia* No. 2, Vol. 1, one Desert Rough-scaled Swift with other interesting specimens of reptile fauna was brought from near Yucca, Arizona, by a Club member, R. Lyttle. This lizard and two others of the same species from the vicinity of Victorville, California, were kept by me in a large wooden terrarium with a screen top, through which light, sunshine, air and flies could enter.

The colors of the lizards were somewhat variable, and the three lizards themselves varied slightly in coloration. The top color was a gray sprinkled at times with tiny blue specks. The under surface is brilliantly marked with two long green blotches on the body and one on the throat, the adjacent edges being confined by black lines. On the shoulders are two black marks, while laterally there are several varying bars of rich orange, yellow or blue, with faint black markings interspersed. When eating, or when excited on a hot day, the Rough-scaled Swift shows off these markings to better advantage than ordinarily. If I knew all there is to know about the why and how of the color changes of this interesting lizard, I should probably be able to

fill with wonderful and engrossing revelations a volume or more of Lorquinias.

As I have not yet had the opportunity to become intimately acquainted with my Desert Rough-scaled Swifts, it is naturally impossible for me to describe the individuality of my pets. Consequently the habits mentioned herein are the sum total of the observations of the three.

From the very first, although nervous and scarey, they showed a marked inclination to make the best gastronomically of their captivity and with philosophical optimism, seized greedily all choice tid-bits that I gave them, eating even from my fingers.

During the summer of 1916, my Desert Rough-scaled Swifts were fed for their main staple of diet many smooth skinned larvae that were saved for me by a Japanese vegetable dealer who found them in his corn. The largest of these larvae were about an inch and three-quarters in length and were shaken roughly from side to side when grabbed by the lizards. Sometimes a half of a larva protruding from the mouth of a hungry lizard was seized by another hungry lizard. If the grip was a good one, both lizards would tug until the victim parted in the neutral zone.

Flies, beetles, locusts, lepidoptera, bugs and other forms of insect life were eaten readily. Isopods and spiders were dashed upon as suddenly as the foregoing and consumed with relish. I tried centipedes, but could not seem to disconcert our "wild and woolly" swifts, who ate them as if they did not object in the least to a little poison as flavor for their meal. One day I brought home a scorpion,—a lively little scorpion with his sting and tail in that excellent working condition which ought to compel the respect and fear of ordinary lizards. Placed in the box with the lizards, the scorpion moved and attracted their attention. There was a rustle of leaves as one of the swifts dashed forth to investigate, a pause in which the scorpion was eyed critically and a quick dart of the lizard's head as, with powerful jaws, it seized the scorpion. The two lacertilian allies rushed upon the scene in time to witness the last of the scorpion as his captor, with vicious crunching bites, stowed the victim where all goods meals belong,—in the stomach.

Ordinarily, the Desert Rough-scaled Swift will not eat anything that is not moving. Dead moths, larvae and red meat were fed to them by being dangled on the end of a wire. When quite alert, these lizards watch things as they fall to the ground and seize food as soon as it strikes earth. By tossing them lettuce I managed to coax them to eat a number of small pieces in this way, although it may not be natural for them to be herbiverous.

Some Desert Night Lizards, *Xantusia vigilis*, whom I desired to give a good home, were placed in the box with the swifts. A few

moments later, I looked in and saw one of these small lizards hanging out of the mouth of one of my swifts. At intervals the swift shook the little fellow violently, took a vicious bite or two and improved his grip to such an extent that soon the Desert Night lizard had entirely disappeared within him. I tried one of the lizards with a dead *vigilis* by moving it about with a long wire. The dead lizard was seized and swallowed as was the live one of the same species.

This spring a salamander, *Batrachoseps attenuatus*, was placed by me on a piece of bark in front of two of my Rough-scaled Swifts. My attention was attracted to something else for a moment, so that when I looked back and saw that one of the lizards had changed his position and that the salamander had disappeared, I could not say that the lizard had eaten the salamander, because I had not seen him do it; but circumstantial evidence was accusingly strong.

In captivity the swifts eat at all times of the day during which it is light enough to see them eat. Foggy mornings make no difference if the weather be warm and the season summer. When fall of 1916 came my swifts were, with the exception of injuries to their tails from ants which had attacked them, in excellent condition with plump rounded bellies that bulged with fat and nutriment to last them through the winter. When the cold weather arrived, they stopped eating and hid themselves beneath pieces of bark that lay under a thick covering of dead leaves, where they passed most of their time, except when the sun shone warm enough to entice them forth on a mild winter day. During the cold season, one died, but this spring the survivors came forth to take up anew their sunny existence as they strive optimistically for the pleasant things of life in spite of the inadequate care that is all I am able to bestow upon them.

PAUL D. R. RUTHLING,
Los Angeles, Cal.

SOME LAND SNAILS OF LOS ANGELES COUNTY

E. P. Chace

Most of the snails that have been found on the club trips during the past year have been turned over to me for determination. They have been very interesting as the distribution and scientific position of some of our local forms are still unsettled.

To date the following species have been collected:

Epiphragmophora tetricula, Binney. The malleated snail. The color ranges from light brown to olive green, with a single dark band bordered by two narrow light ones; mature specimens are quite round with a well rounded aperture and reflected and thickened lip.

Usually 20 to 30 mm. in diameter. This, one of our largest native snails, has been collected in Eaton's Canyon, Sawpit Canyon, and in the Arroyo Seco near Busch's Gardens.

As a species it is quite widely distributed though seldom found in large colonies. I have specimens from Fresno, San Bernardino, San Diego, Orange, and Los Angeles counties.

Epiphragmophora traski, Newcomb. Trask's snail. Similar to the last in color, but usually slightly smaller and flatter and with finely incised spiral lines instead of the hammer-marks of that species. Specimens have been collected in Millard's Canyon, in the Arroyo Seco near Busch's Gardens, in Los Angeles, and at Point Firmin.

Epiphragmophora cuyamacensis, Bartsch. A recently described species, in which the surface of the shell is covered with minute pustules instead of incised spiral lines like those of *traski*. One immature specimen that is apparently of this species has been found near the Dawn Mine, Millard's Canyon.

Glyptostoma newberryanum, Binney. Newberry's snail. Another of our large native species. Its surface is smooth, almost polished in appearance and of a rich brownish-red color. The shell is rather flat and the lip is always sharp, never expanded. This species has been found in Millard's Canyon, the Tejunga, and on the hills at Dominguez Junction. It is found in San Diego County, possibly farther south. So far as I know, it is not found north of the San Gabriel Range.

Helix aspersa, Muller. The spotted snail. This common garden pest is too familiar to need description. This species was originally introduced from Europe by French vineyardists who used it as food. It has spread rapidly and specimens have been brought in from Sawpit Canyon, although it usually stays near cultivated gardens.

Pyramidula cronkhitei, Newcomb. Four small, white shells resembling *Pyramidula cronkhitei*, Newcomb, were found in the leaf mould in Millard's canyon. They are about 6 mm. in diameter and the four whorls are crossed by numerous heavy ribs.

Punctum conspectum, Bland. This tiny brown snail, a little larger than a pin-head, has been found in devaying leaves in the Arroyo Seco near Busch's Gardens. It is common in lawns and fern boxes in various parts of Los Angeles.

Vallonia pulchella, Muller. A tiny, smooth, white snail that is commonly found with the last. It is so transparent that with the aid of a 20 diameter Coddington lens I have watched its heart beating.

There are several other species reported from the San Bernardino mountains and more intensive collecting will probably reveal many of them in the San Gabriel Range. I shall greatly appreciate any further material especially that from the upper reaches of the canyons.

While Catalina is a part of Los Angeles County its fauna, like that of all the Channel Islands, is more closely allied to that of Lower California than to that of California proper.

NEW PLANT RECORDS

F. Grinnell, Jr.

Monardella macrantha Gray.—This plant was discovered in fair abundance in aspect of not more than twenty-five feet along the trail near Sturtevant's Camp, in the upper Big Santa Anita Canyon. The plants were on a north-facing slope of the Upper Sonoran, with many Big Cone Spruces and Golden Oak forming quite a forest. They were especially attractive on account of their deep red corollas. As Hall has pointed out, this group is very plastic and varies to a great extent according to environment. My specimens were identified by Dr. A. Davidson, to whom specimens have been presented. Others will be deposited with Geo. L. Moxley, Stanford University, The California Academy of Sciences, and the Lorquin Club Herbarium.

It has previously been recorded from the San Pedro Martir mountains in Lower California north to the San Bernardino mountains, and many years ago it was collected in the Santa Lucia mountains of Monterey county by Vasey. This is the first record from the San Gabriel mountains. Mr. Charles F. Richter and the writer made the discovery on the regular Club field trip, August 12th, 1917.

Zauschneria viscosa Moxley.—Charles F. Richter and the writer collected this in flower on the ridge between Mt. Wilson and Mt. San Gabriel on July 29th, 1917. Specimens were shown to Dr. Davidson, who considers it a good species. The viscous or slimy leaves and their ovate shape are marked characteristics. The various forms of *Zauschneria* are xerophytic and have adopted different ways of protection.

Calochortus invenustus var. *montanus* Parish.—Determined by Dr. Davidson. This was very common on Barley Flats, July 9th, 1917. The only species of *Calochortus* noted there.

WOOD RATS OF THE GENUS NEOTOMA

Luther Little, 2d.

The earliest reference in literature to a native Wood Rat of the genus *Neotoma* was by Peter Kalm, who, in 1749, cited John Bartram, of Philadelphia, as authority for the statement that he saw a "great number" of rats which lived among the rocks in the Blue Mountains of Pennsylvania, come out at night and make a terrible noise.

Since that reference, many new species have been discovered by the various zoologists. Today the genus *Neotoma* is divided into several sub-genera, *Neotoma*, *Homodontomys* and *Teonoma*. The sub-genus *Neotoma*, containing 56 species and sub-species, is readily divisible into six rather well marked, yet closely related groups.

The genus *Neotoma* is restricted to North America. It reaches from ocean to ocean in the latitude of the lower Mississippi, but the species are most numerous along the backbone of the continent from Nicaragua and Guatemala northward through Mexico and the southwestern United States. The species and subspecies are usually limited to one or two life zones, but sometimes groups of closely related forms extend throughout several zones.

The habits of the various species are very similar, but they may vary considerably in the same species according to the environments. Most of the rats prefer rocky ledges and crevices for their homes; some pile up sticks and leaves making a large conical nest under oak trees or bushes, usually on sloping ground. The rats that prefer these nests often build a nest in the same tree which shades their big nest on the ground. These big nests contain many chambers and runways, some of which run into the ground under the nest. On the desert plains the wood rats' nests are composed of a prickly mass of cactus and thorns. It is wonderful how they can live in them comfortably.

During the night the wood rats come out of their nests and scout around for food. Some of the rats cannot wait for it to get dark, but come out along toward dusk and scamper about. They are strictly vegetarian and feed on cactus, fruits, leaves and other greens.

The wood rat that I know best is the "Large Eared Wood Rat" (*Neotoma fuscipes macrotis* Thomas). This rat is found in the upper Sonoran and lower Transition zones in the San Diegan district northwest of the Mexican line, including also the narrow coast strip farther northward, even to Monterey. In the San Gabriel Wash, near the Foothill Boulevard, this large-eared rat is very abundant. Its nests, built in clumps of cactus, are constructed of sticks and rubbish of all sorts, including the dead parts of cacti. Any one unfamiliar with these rats would at first perhaps not observe their nest at all. When once discovered they are very noticeable, with their many runways through the grasses. In size these rats are about the same as the regular old brown rat, with which every one is familiar. The average length is about 357 mm., tail vertebræ, 170 mm., hind foot, 37 mm.

Their color in a fresh pelage is of a grayish brown, sometimes with an ochraceous buff mixed in. On the face and sides this color becomes much lighter. The black-tipped hairs darken the back and give it a grizzled effect. The under surface is white with a pale buff on the belly. The front feet are white, as are also the hind feet, except for a little dusky coloring. The dorsal surface of the tail is a brownish black; the under part is whitish.

When trapping for rats I use a regular rat trap, which is like the mouse trap, but much larger. These traps are very effective, but oftentimes they crush the skull, which spoils the specimen. The skull is one of the main factors in determining the different species. The Schuyler trap is about the best on the market, but rather expensive. For bait I use raisins or prunes. Sometimes they will come to investigate cheese or bacon rind. Probably the smell attracts them. After catching the rats I make a scientific study skin and place them in a cabinet to protect them from insects.

REFERENCES:

North American Fauna No. 31. The Revision of the Wood Rats of the Genus *Neotoma*. By Edward A. Goldman.

Distributional List of the Mammals of California. By Joseph Grinnell.

NEW MEMBERS

Miss Florence E. Young, 517 So. Boyle Ave., Los Angeles.
A. G. Barr, 95 Yale St., Pasadena, Cal.

Harold S. Duey, 825 No. Louise Ave., Glendale, Cal.

H. M. Simms, 1109 No. Louise Ave., Glendale, Cal.

Richard G. Davis, 425 No. Madison Ave., Pasadena, Cal.

Eugene O. Murmann, 240 So. Central Ave., Glendale, Cal.

Alfred Cookman, Long Beach High School, Long Beach, Cal.

ANNOUNCEMENTS

The regular monthly Club meeting will be held in the Lecture Room of the Public Library, Tuesday evening, October 2nd, 1917, at 7:45 o'clock. Members are urged to be present. Visitors are welcome.

The Geological Section will meet in the Music Room of the Public Library, Tuesday evening, September 18th, at 7:30 o'clock. All interested in the study of Geology are invited.

The Botanical Section will meet at the Arroyo Seco Branch Library, Wednesday evening, September 26th, at 7 o'clock. All who are interested in any phase of plant study are invited to be present and take part in the meeting.

Mr. Raoul M. May announces that an Entomological Section will be organized on Saturday evening, September 15th, at 7 o'clock, in the Music Room of the Public Library. The Section is to meet on the third Saturday evening of each month. All who are interested in insect life are invited to join in the activities of this Section.

The Club Librarian, Mr. Raoul M. May, announces that he has completed a catalogue of the papers now in the Library, listing them

alphabetically and by subject. The Library is located at 2202 West 10th St., where it may be consulted by anyone interested in biological or geological lines, any day except Friday or Saturday, after 7 P. M. Take West Ninth or West Eleventh St. cars and get off at Lake St. Anyone having papers on Natural History subjects which they no longer want will confer a favor on the Club by donating them to the Library.

LORQUIN NATURAL HISTORY CLUB FIELD TRIPS

Sept. 23.—Negro Canyon. Meet at P. E. Main St. station at 7:30 A. M. Take 7:41 Pasadena Short Line car, transfer to Lincoln Ave. car and ride to end of line, where the party will be met by Mr. Barr, leader. Distance about three miles.

Sept. 30—Coast north of Santa Monica Long Wharf. The leaders, Mr. and Mrs. Chace, will leave Hill St. station on the 9 A. M. Short Line car, connecting with the 9:55 Port Los Angeles car at Santa Monica. Bring lunch and canteens. If you wish to collect shells or Marine Algae bring an extra pair of old shoes.

Oct. 7—No scheduled trip.

Oct. 16—Fossil Deposit, West Alhambra. Meet at P. E. Main St. station at 8:15 A. M. Take Alhambra-San Gabriel car leaving at 8:24. Get off at 1st St., Alhambra, and walk two blocks south to 123 1st St., the home of Mr. Hadley, who will show his fossil collection, and conduct the party to the fossil deposit of West Alhambra. About two miles' walk. For club members only.

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INSECT COLLECTING ON A MOUNTAIN TRAIL

Alonzo Davis.

About 7:15 on the morning of June 9th, 1917, Mr. Grinnell and I started from Pasadena, riding to the end of the Lincoln Avenue car line and then walking to the beginning of the trail up the Arroyo Seco. The first three hundred feet of this trail is the worst of the whole trip. About a mile up the Arroyo, at the foot of the Sister Elsie Peak trail, Mr. Grinnell found a small salamander. We filled our canteens at the stream and started up the trail, which was quite brushy at first, and we saw numerous flies and bees in the brush. We saw peculiar black bees of which we caught ten or twelve.

At about 2000 feet altitude I took the first beetle, an *Acmaedera angelica*. From there on the beetles grew rather common, and then gradually scarcer, till few were taken. They were most common at an altitude of about 3500 to 4000 feet. Flies, bees, wasps and butterflies abounded and a few grasshoppers were also taken.

Lizards were common. The ones we saw were the fence lizard and the brown shouldered lizard. We saw a striped racer as it rushed down a wash. At about 4000 feet I heard a sudden whir and stopped short till I could locate the cause of the sound. It was a rattlesnake about two feet long, black, banded with creamy white. It went under a shelving rock beside the trail. I rolled the stone over so as to pin the snake down, but he got out and went under another rock where I couldn't catch him. We went up to about 4500 or 5000 feet, took off our packs, hunted moths and other dusk-fliers, watched the lights in the valley below, and then went to bed.

In the morning there was an ocean of fog stretching as far as we could see. The sun's rays turned the fog pink, and the tops of the mountains looked like jagged islands in a pink sea. We started down about eight o'clock. On the way down we saw a pair of band-tailed pigeons flying very rapidly about sixty feet above the trail. All the way down we saw small green *Chrysomelids* on the Gilia. There is also a curious, sticky plant, *Hulsea heterochroma*, growing at about 4000 feet, in the sandy leaf mould. Near the foot of the trail we saw a Stejneger's whip-tailed lizard.

The following is a more or less complete list of the beetles we took on the trip.

- Hippodamia ambigua *Lec.*
Coccinella californica *Maun.*
Chrysobothris mali *Horn.*
Acmaeodera jocosa *Fall.*
Acmaeodera coquilletti *Fall.*
Acmaeodera hepburnii *Lec.*
Acmaeodera quadriseriata *Fall.*
Acmaeodera acuta *Lec.*
Acmaeodera connexa *Lec.*
Acmaeodera vandykei *Fall.*
Acmaeodera dohrni *Horn.*
Acmaeodera prorsa *Fall.*
Acmaeodera dolorosa *Fall.*
Agrilus jacobinus *Horn.*
Ellychnia californica *Moto.*
Listrus luteipes *Lec.*
Serica fimbriata *Lec.*
Phobetus comatus *Lec.*
Centrodera nevadica *Lec.*
Acmaeops falsa *Lec.*
Leptura sexspilota *Lec.*
Pachybrachys lustrans *Lec.*
Cleodes consobrina *Lec.*
Nemognatha nigripennis *Lec.*, sp. and var.
-

THE SHARP-SHINED HAWK OF THE SAN GABRIEL MOUNTAINS

By Alfred Cookman.

Do you enjoy studying the life habits of birds? Are you interested in their striking characteristics? If you are not at home among these strange creatures of the open air, I urge you to begin at once to learn more about their ways. A study of the life history and the economic importance of bird-life will add a zest to life—a zest be it noted that enriches without harm to any living creature. The study of Nature leads one into the realm of Natural Phenomena where new worlds of scientific interest unfold in volumes of thought and wisdom. Here are revealed, matchless comprehension running into perfect wisdom. Nature is a pictorial review non-comparable to any-

thing that has ever been shaped, or moulded, or controlled with human hands. Nature speaks the omnipresence of a God.

Among the many species of avian life inhabiting within the confines of the state of California, I know of no bird whose striking personality is of more than ornithological interest. "The boldest fellow for his inches that wears feathers," says one of our learned writers on bird-life. The Sharp-shinned hawk of the Sierras is a representative of the falcon group of the birds of prey. A bird that has become of decided economic importance. A bird that is not protected by law. He is a thief, a robber and a cruel murderer, and yet, I must admire him. He is dynamic, energetic and beautiful—one of the handsomest representativeness of his race. A lover of the high altitudes, a champion on the wing and a fierce defender of his home.

He is true to his mate and is ever attentive to the young in the nest—guarding and protecting them with unique paternal care.

Equally at home in the dense shadows of the forest, on the treeless plains, or in the pine-covered mountain tops, the little warrior requires but two things,—plenty of food and good water.

His choice tidbit consists almost wholly of birds. Alas! We hear the high-keyed shrill whistle or shriek, that is uttered when in triumph he dashes into a terrorize¹ flock of small sparrows or down into a barn-yard full of poultry. He fears no one, and even in the face of the farmer, he will attack a hen many times his own weight, even though she is surrounded by her own kin. It is quite true that he is the most destructive hawk in the state and without fear and without mercy. A bounty should be offered on his head, because of his continued overt acts.

I find, however, that the female of the species is more dangerous than the male. She is the larger of the sex and fiercer by far, and consequently the more rapacious.

The general color markings of the sexes are very similar, except that the male is darker and the colorings deeper. The uniform markings of the species are as follows: The upper parts are slate and the under parts white, heavy barred and spotted with chestnut. The tail is marked beneath with three or four narrow black bands and a white tip. The average size of the male is 10 inches and that of the female 12 inches from beak to tip of the tail. They breed in the month of April or May, and the breeding range is pretty well scattered over the whole of North America, even into Alaska. The nest is a huge platform of sticks, lined with feathers and fibre of leaves and is usually placed in tall trees about sixty feet up near some mountain stream where the young can hear the murmuring of the distant waters flowing gently among the huge granite peaks in the canyon. The song of the cool, rippling stream oftentimes lures one away into the land of imagination.

LORQUIN'S ADMIRAL

Basilarchia lorquinii (Boisduval) Scudder

This butterfly, which is found on the Pacific Coast from San Diego County to British Columbia, is one of the most beautiful, as well as the most interesting of butterflies to the student of bionomics.

It was Poulton (in 1908 in the transactions of the Entomological Society of London) who suggested the mimetic relations with *Adelpha californica*, accounting thus for its change of color from the ancestral *weidemeyeri*, though this newest idea of mimicry leaves much to be explained.

Limenitis lorquini was first named and described by Boisduval in the classic *Lépidoptères de la Californie*, Paris, 1852, in the *Annales de la Société Entomologique de France*, from specimens collected by Pierre Joseph Michel Lorquin between 1849 and 1851, in a short Latin and a longer French description. Boisduval says: "Cette belle espèce, que nous avons dédiée à M. Lorquin, comme une faible récompense de son zèle pour l'entomologie," etc., comparing it with *camilla*, a European butterfly.

It is found from June to September around willows along all our water courses and lakes from the Lower Sonoran Zone to the Upper Transition Zone. The caterpillar feeds on willow.

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CONCERNING THE BUTTERFLY

TYPE LOCALITY: "Elle se trouve en mai et juin. Elle a les moeurs de notre *Camilla*." Probably near San Francisco.

RANGE: Vancouver Island, British Columbia, southward through California, Arizona, Nevada (Skinner). All through California.

ZONAL DISTRIBUTION: Lower Sonoran to Upper Transition.

NOTES: Interesting for the case of mimicry described by Poulton.

FOOD PLANT: Willows. "Occasionally on oak," Henry Edwards.

TIME OF APPEARANCE: June to September.

NEAREST RELATIVE: *wiedemeyeri*, of the Rocky Mountain region, and *camilla* of Europe (Boisduval).

F. GRINNELL, JR.

BIDENS FRONDOSA LINN.

On Aug. 17th, 1916, in company with Charles F. Richter, I found in the Los Angeles Riverbed, near the North Broadway bridge, a plant which I labeled "Bidens sp." and laid away for future study. It was nearly forgotten until recently Dr. A. Davidson found the same plant on Alvarado Street and gave me a specimen. Careful examination shows them to be *Bidens frondosa* L., a plant hitherto not reported from Southern California. Jepson (Erythea 1:244, and Fl. W. Mid. Cal.) reports it very common on the lower Sacramento River, but these are the only references I have found to the plant in this State. It may have come in from that region along the Southern Pacific, or from the middle West along the Santa Fe. From the two widely separated stations it would seem to be well established and a probably permanent member of our flora.

GEORGE L. MOXLEY.

SOME INTERESTING PLANTS FROM THE SAN GABRIEL MOUNTAINS

Charles F. Richter and the writer observed the following plants during the last week of August on a trip through the mountains.

Dr. Davidson or Mr. Moxley are responsible for the determinations.
Monardella linoides Gray. North side of Mt. Waterman, Aug. 29.

In only a few places.

Calamintha mimuloides Benth. This was collected on a wet bank about a mile below Oakewylde, in the Arroyo Seco, Aug. 27th.

Parnassia cirrata Piper. Collected in a wet hillside meadow above Coldbrook Camp, on the North Fork of the San Gabriel River, Sept. 2nd.

Pentstemon labrosus Hook. Common from Pine Flats to Buckhorn Canyon.

Wyethia ovata T. & G. This large-leaved composite was common under the pines on Pine Flats and in full flower at the time of our visit.

Silene parishii Wats. Frequent along the Pleasant View Ridge.

Pyrola pallida Greene. (Probably.) Collected on the Pleasant View Ridge.

A species of *Cordylanthus* which puzzled us greatly was common all around Mt. Waterman to Mt. Islip.

There are yet many discoveries to be made, especially during the late summer and fall when so little collecting is done, in the Southern California mountains.

F. GRINNELL, JR.

ANNOUNCEMENTS

The regular monthly Club meeting will be held in the Lecture Room of the Public Library Tuesday evening, November 6th, 1917, at 7:45 o'clock. Prof. Melville Dozier will speak on The Tides. Members are urged to be present and visitors are welcome.

The Geological Section will meet in the Music Room of the Public Library Tuesday evenings, October 16th and November 20th, at 7:30 o'clock. Mr. E. E. Hadley is planning a series of talks for beginning students in geology.

The Botanical Section will meet at the Arroyo Seco Branch Library Wednesday evening, October 24th, at 7 o'clock. All who are interested in any phase of plant study are invited to come and take part in the meeting.

The Entomological Section will meet in the Music Room of the Public Library Saturday evening, October 20th, at 7 o'clock. For all students of insect life.

A Chemical Section has been suggested. All who are interested are asked to notify the Club Secretary.

At the Club business meeting, held at the home of George Malcolm, Oct. 5th, the following officers were elected for the year 1917-1918:

President, Donuil Hillis; Vice-President, E. E. Hadley; Secretary, George Malcolm; Treasurer, E. P. Chace; Membership Committee, E. E. Hadley, Chairman, Raoul M. May, Paul Bonnot; Publication Committee, E. P. Chace, Chairman, E. E. Hadley, Stuart S. Towne.

On account of adverse conditions brought about by the war, our President, Paul Rüthling, has been obliged to discontinue the occupation of vacuum cleaning, which he has been following for the past two years. He is now away from Los Angeles on a business trip that will probably include Mexico. His mother is remaining in Los Angeles. Paul wishes to say "Good-bye" to all those whom he did not have the opportunity to see before leaving.

The Club address has been changed to 2202 West 10th St., Los Angeles, Cal. All exchanges and communications for the Club should be sent to the new address.

An abnormal pod in *Diplotaxis*. Recently while looking over a small patch of *Diplotaxis tenuifolia* DC. I came upon a stem bearing two unusual pods. The normal pod is flat and two valved, dehiscing along the margins. These two pods were triangular and apparently three valved, and would have probably separated into three parts at maturity. I hunted for some time but found no others not of the normal form.—G. L. M.

NEW MEMBERS

Norman E. Humphrey, 131 No. Euclid Ave., Pasadena, Cal.
Waldo L. Schmitt, U. S. National Museum, Washington, D. C.
Hawthorne Gray, 3118 East 4th St., Los Angeles, Cal.
Raymond T. Hill, 1249 Royal Court, Los Angeles, Cal.

CLUB FIELD TRIPS

Oct. 21st. Elysian Park. Meet at North Broadway Bridge at 8 o'clock A. M. Leader, Herman Klotz.

Oct. 28th. Monrovia Canyon. Meet at Pacific Electric Main St. Station at 8:45 A. M. Take 9 o'clock car for Monrovia. About five miles. Leader, Adele Schmidt.

Nov. 4th. No scheduled trip.

Nov. 11th. Negro Canyon. Meets at Pacific Electric Main St. Station at 7:30 A. M. Take 7:41 Pasadena Short Line car. Transfer to Lincoln Ave. car and ride to end of line. Mr. Barr, Leader.

FOR SALE, WANTS AND EXCHANGES

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STUDIES IN ZOOLOGY.—I.

Osteology

To any one intending to make a study in any line of vertebrate zoology a knowledge of osteology is quite essential. Without the scientific terminology one would be at a loss to understand the literature of one's chosen subject. One would be more or less out of touch with specialists in other lines of vertebrate study and this must be avoided as much as possible.

With the object in view of directing the attention of many to the beauty and value of such a course, I shall attempt to make plain some of the beautiful things related to such a study.

As an instance let us suppose that I am interested especially in herpetology—then my scientific vocabulary relating thereto must closely resemble the vocabulary of my friend whose specialty is the study of birds. The two vocabularies are similar but by no means identical. They must closely resemble each other because both groups as we now see them have descended from common ancestors and must have a striking likeness in homological parts and therefore similarly related in terminology. They must also be somewhat dissimilar because of the unlikeness of general structure and of particular parts which have come about through æons of gradual change. To be specific, we may use the lower jaw of any vertebrate as an illustration. We know that in all vertebrates the lower jaw is developed from or about a primitive structure called Meckel's cartilage. We know, also, that from a part of this cartilage there develops a bone common to reptiles and birds, known as the quadrate bone, and we know the subsequent history of it. We cannot be correctly informed without being familiar with the origin and destiny of this bone throughout the phylogenetic history of the vertebrate stem. What is true of this particular element is equally true of many other parts which might be cited in evidence.

The most thoroughly informed generalist will be, other things being equal, the best specialist.

It matters little where we begin to study vertebrates—we no sooner get a good knowledge of any individual or group than we begin to inquire of its ancestry—whence did it come? This leads us to

the investigation of the predecessors of the form in question and so we soon feel the need of a broader knowledge. This brings us to the point in question. How shall we become familiar with the anatomy of the various groups of animals? The answer is, "By knowing something of one form and then comparing it with related forms—that is the secret."

The term "skeleton," in its wider sense, includes all the hard parts of an animal, both internal and external, but in the present discussion we shall have in mind only the endoskeleton, with an occasional reference to the various exoskeletal elements by way of comparison.

Without attempting to discuss kinds of bones as to their origin in the individual and the race, we will proceed to examine the vertebrate skeleton as a whole.

All true vertebrates have an axial skeleton, including the skull and numerous vertebrae.

The amphioxus has not reached this stage. The cyclostomes approach a step nearer, but in those also no centra are formed. Thus we see preparations for a vertebral column, but the plan has not yet been carried out. In the next group, the elasmobranchs, the typical double-concave centra are formed in cartilage with more or less calcification.

In this and subsequent groups of fishes we find, in addition to the axial skeleton, appendages known as fins and these are called the appendicular skeleton. These fins are stiffened and made serviceable by the addition of rays or rods. Certain of these rods enlarge and others disappear, and the net result is a rudimentary leg with humerus, ulna and radius, and hand, including the digits; the femur, tibia, fibula, with the foot including the digits.

Now we see the whole skeleton, both axial and appendicular.

Next we will take up the skull and observe its various modifications. After that the vertebral column, and then the skeleton of the appendages.

FRANK C. CLARK.

The above article is the first of a series by Dr. Clark which will appear in *Lorquinia* from time to time.

A VACATION TRIP

For a number of years I have been wishing to take a vacation trip to the Southern Sierras of Tulare County and this summer my desire was gratified. We—there were five in the party—made the trip in an "autoFord," which gave us opportunity to see the country as we went along, although we could not spend much time on the way on account of the distance to be traveled.

Starting from Van Nuys on the morning of June 16th, we went by way of the Ridge Route. The road is mostly finished State highway

and makes the going very good indeed. After leaving Newhall the entire way was new to me and I enjoyed every bit of it, both from the scenic standpoint and from the many scientific interests to be noted. In the Castaic valley I first noted a plant of the Evening Primrose family which I believe is *Anogra californica* (Wats.) Small. I may as well say right here that I made no collections on the way up as I expected to return the same way, and for this reason I am unable to say positively what some of the plants were. Here also I saw a cactus of the genus *Opuntia* that I hoped to collect as I came home. Climbing out of the Castaic valley we first saw the Thistle Poppy, *Argemone platyceras hispida* (Gray) Prain. It was very plentiful along the way through the mountains.

Our Geologically inclined members would have enjoyed the ride up this side of Liebre mountain. The cuts for the State highway disclosed many strata of alternate sandstones and shales and I wished for time to look for fossils, but the day was getting hot and we had a long way to go. On this part of the journey we were treated to two blowouts and had no extra tire along. This, of course, added interest and zest to the trip. The north side of the mountain is of granite formation. Descending this grade and passing Lake Lebec we entered the Tejon Pass, one of the most beautiful places in the entire trip. It is well wooded with oaks and box-elder and we here first came upon the California Buckeye, *Aesculus californica* Nutt., which was in full bloom. The wild grape vines were also just in flower and added their part to the general beauty of the scene.

Coming out of the Tejon Pass down what is known as the Grapevine, on account of its many turns and twists, we entered upon the longest stretch of straight road I have seen for many a day. It lay like a ribbon across the landscape and seemed to have no turn as far as the eye could see. This portion of the way was dry and hot and we were glad when we reached Bakersfield, where we found some of the best buttermilk that ever was. After crossing the Kern River we struck the most disagreeable part of the journey. The wind seemed to come out of a furnace and fairly scorched the skin. I noticed long lines of birds in the shade of the telegraph poles with their wings held away from their bodies and their beaks wide open, panting for breath. But even the unpleasant things have an end and about sunset we reached my father's ranch at Ducor. Here we rested over Sunday.

Monday morning, bright and early, we started for the mountains. For about seven miles the road runs due east from Ducor over a gently undulating plain which becomes more and more rolling as the hills are approached. Reaching the hills it winds through a park-like country dotted with good sized oak trees and abounding in large boulders, if such large rocks can be called by that name. There is an excellent auto road to and beyond California Hot Springs. Our des-

tination was Pine Flat, a resort about a mile and a half beyond Hot Springs. Here is a valley somewhat broader than the canyons up which we had come, having a large number of noble pine trees, some of which were over two hundred feet in height. One of these shaded my open air bedroom and I enjoyed very much the waking early in the morning and watching the birds high up in the branches. There were many robins nesting here and they made a great deal of noise every morning, so that we never needed an alarm clock. Here at Pine Flat we rested, fished, walked, botanized or read as we desired. One day we went about four miles up the canyon of Deer Creek to see the nearest Sequoias. There are three or four here and about as many more something less than a mile farther on. The largest of this group is about thirty feet in diameter and I don't know how high.

On Friday morning we came back to Ducor and Saturday morning started for home. We came back by the same route as far as Lebec and then turned off toward Elizabeth Lake and Bouquet Canyon. In the west end of Antelope Valley we came through a short stretch of real desert. The vegetation was chiefly the tree yucca, juniper and a small blue sage.

The east wall of Bouquet Canyon should interest our geologists on account of two strata near the top of the hills. One stratum is very light in color and the transition is abrupt, making the difference very noticeable.

I have purposely refrained from mentioning my plant collections as I have not yet classified them all. In due time I will give some notes on the more important ones.

GEORGE L. MOXLEY.

SNAKE VENOM

The subject of snake venom and the phenomena related thereto as regards the human organism is or should be of vital interest to everyone who ventures far from the pavements of civilization and the safeguards attached to it.

The mythological systems from the earliest Asiatic to the modern Irish all recognize the reptile as a creature whose existence is incompatible with human welfare. This attitude has caused all members of the class Reptilia to fall into disrepute, and resulted in innumerable and absurd stories of their habits as manhunters. To correlate these fictions are an equal number of misstatements of what to do when anyone is bitten by a poisonous reptile.

The external structural differences between poisonous and non-poisonous snakes are beyond the scope of this paper, and we will take it for granted that the reader can distinguish a venomous snake.

The majority of the would-be cures have proved ineffectual because the originators were ignorant of the toxicological properties of the peculiar venom for which an antidote was sought.

The venom of the Rattlesnake, "Crotalus," is the only one which will be considered, as the other venoms have chemical differences which cannot be considered, but the method of treatment is identical. When the snake strikes, the venom is injected subcutaneously by the fangs, which are slightly curved and resemble a very sharp hypodermic needle with the opening on the side, just above the point. The active principle, crotalins, is alkaloidal. The alkaloid contains three constituents, a peptone which is neurotoxic and causes paralysis of the efferent or motory nerve centers. The climax of this action is paralysis of the respiratory organs, and the patient dies from inability to breathe. The external symptoms will be shortness of breath and soon cyanosis or a blue discoloration of the skin. The second constituent is a globulin having a hemolytic action. This destroys the power of coagulation in the blood and extravasation, or a hemorrhage in which the blood escapes from the vessels into the rest of the body, sets in. The third constituent is a fibrin ferment causing gangrene, and resulting in death from mortification of the affected parts. This may not appear until later.

In treating snakebite, "Preparedness" is the keystone of success. The operator should have a good knowledge of anatomy, with special reference to the circulation, the more complete the better. Keep cool and don't let the patient get excited. More cases die of hysteria than poison. Let whiskey *alone*. More cases have been lost than cured by the use of alcohol, which depresses the whole system. Antivenin is undoubtedly the ideal treatment, but at present the antivenins of Calmette, Flexner, Noguchi and Brazil are all monovalent and a different one must be carried for each species of snake. Antivenins are also not sold on the open market and must be obtained from the maker. The H. K. Mulford Co. expect to put a polyvalent antivenin on the market soon. In the antivenin treatment, one or more injections are given as required, and as the solution is shipped in sterile glass hypodermics containing the required dose, treatment is simple.

In the absence of antivenin, use potassium permanganate, which will oxidize the poison to harmless compounds if used soon enough. Tie any kind of a ligature *loosely* between the wound and heart, put a stick through the ligature and twist it to tighten. With a sharp, sterile blade cut across the wound both ways and allow it to bleed moderately. Inject two or three hypodermics of potassium permanganate solution in and around the wound. If the patient shows marked depression of circulation, use strychnine in the hypodermic. If the pain due to ligature cutting off the circulation is marked, partially loosen it for a few minutes, as keeping it tight too long may

result in mortification of the segregated member of the body.

The outfit for the potassium permanganate treatment should include the following:

- 1 small scalpel of best steel,
- 1 all-metal hypodermic with needles,
- 1 bottle potassium permanganate tablets for syringe,
- 1 bottle strychnine sulfate tablets for syringe,
- 1 bottle distilled water,
- 1 piece of cotton goods of firm weave, two inches by thirty inches, for ligature,
- 1 roller bandage, two inches by ten yards.

These can all be packed in a small leather case for carrying. If you carry the case through life and never use it, you are fortunate, and charge the expense to insurance. If you have to use it on yourself or anyone else, you will never regret the labor of carrying the load.

RICHARD DAVIS.

FOSSIL CHITONS

During the past five years Dr. F. C. Clark has been digging in the Pliocene and Pleistocene deposits of the Santa Monica Hills. Needless to say he has accumulated much interesting material, including the minute Foraminifera and Bryozoa, and many different forms of Gastropoda and Pelecypoda. He has recently loaned me a fine lot of Chiton valves from the Pleistocene deposits, and among them I have identified the following:

Ischnochiton acrior, Cpr. Two anterior valves, two posterior valves, two median valves. This species is now confined to the Panamaic fauna.

Ischnochiton conspicuus, Cpr. The largest and showiest of the recent local chitons. One small anterior and one small posterior valve are provisionally referred to this species.

Ischnochiton clathratus, Rve. Several median valves.

Callistochiton crassicostatus, Pils. One posterior valve, a number of anterior and median valves.

C. palmulatus Cpr. and var. *mirabilis*, Pils. More than sixty anterior valves, as many posterior, and nine median valves, besides many worn median valves that may perhaps belong here.

Trachydermon dentiens, Gld. Two anterior valves, one posterior valve.

Mopaliidae. Five anterior valves and two median valves belonging to this family were found, but as the separation of the different groups of this family depends largely on mantle characters no more definite identification has been attempted.

As shown by the above list, the fossil chitons of the Santa Monica deposits belonged to about the same species as those of the present day. There were apparently, however, many more specimens belonging to the genus *Callistochiton* than we now find in shore collecting, although their habit of living in crevices in the rocks at extreme low tide suggests that they may be more plentiful beyond the collector's reach.

E. CHACE.

FIELD EXCURSIONS

November 18th. Arroyo Seco. Meet at Pacific Electric Main Street Station at 7:30. Take 7:41 Pasadena Short Line car. Transfer to Lincoln Avenue car and ride to end of line. Three miles to Ranger's cabin, or farther for those who desire. Leader, Percival Chase.

November 25th. No scheduled trip.

December 2nd. Flintridge and Devil's Gate. Meet at P. E. Main Street Station at 7:30; transfer to Lincoln Avenue car. About five miles. The trip will be led by Mr. Barr, who will meet the party in Pasadena.

December 9th. No scheduled trip.

December 16th. Point White. Meet at P. E. Main Street Station at 8:00 a. m., and take 8:11 San Pedro car. Change to Point Fermin car at San Pedro. About six miles' walk. Leader, Mr. Chace.

ANNOUNCEMENTS

The regular monthly Club meeting will be held in the Lecture Room of the Public Library, Tuesday evening, December 4, 1917, at 7:45 p. m. There will be an interesting talk on Chemistry by Mr. Grimes. All natural history students are invited and all members should be present.

The Geological Section will meet in the Music Room of the Public Library, Tuesday evening, November 20th, at 7:30 p. m. Mr. Hadley's talks for beginners in geology are excellent. Anyone interested in geology is welcome.

LIBRARY NOTES

The October number of *Aquatic Life* is now in the Club library. It has several very interesting articles, including one on "The Pigmy Sunfishes," by Robert E. Coker of the U. S. Bureau of Fisheries.

The October number of The American Museum Journal is especially good. The article by William K. Gregory on "The Evolution of the Human Race" will interest everyone. Botanists and photographers will be interested in an article on the Giant Manzanitas of Clear Lake.

Among the month's additions to the Lorquin Club library is No. 1, Vol. I, of the Aquatic World, published by August M. Roth, and edited by S. Chichester Lloyd, of Baltimore, Md. It contains several well written articles and is nicely gotten out. Anyone interested in fish-keeping or aquaria will find this well worth looking up.

These are only a few of the many good things in the Club library. Get in touch with our librarian, Mr. May, and see what he has in your special line of study.

AN OBSERVATION ON THE CLARKE NUTCRACKER

On August 31, 1917, Charles F. Richter and the writer observed this interesting bird at the north base of Mt. Islip, San Gabriel Mountains. On a sloping tableland there is a dense matted growth of Chinquapin, Manzanita, *Chrysothamnus*, *Ceanothus cordulatus*. Fostered everywhere and here were a number of the Clarke Nutcracker—some time we had noticed the opened burs of the Chinquapin scattered (*Nucifraga columbiana*, Wilson) busily getting the burs, which they usually carried to a pine tree before they opened them, extracted the seeds and dropped the empty husks to the ground. This bird is large and showy, so that it seemed to be the commonest avian inhabitant of this table land.

F. GRINNELL, JR.

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NOTES ON SOME MOLLUSC-EATING BIRDS

By George Willett

During the past six summers spent in southeastern Alaska, I have been interested in noting the number of species of birds that subsist to a greater or less extent on molluscs.

Among the land birds partial to such a diet are the Northern Raven (*Corvus corax principalis*), and the Northwest Crow (*Corvus caurinus*). Numbers of these birds may be seen at each low tide walking over the rocks near the water's edge, lifting the sea weed aside with their bills, in search of particularly choice morsels, such as the Northern Abalone (*Haliotis kamtschatkana*), Giant Chiton (*Cryptochiton stelleri*), and the Rubber Chiton (*Katherina tunicata*). Shells of these three species are frequently found in the woods at a considerable distance from the water, having been carried by the birds to favorite roosting places to be eaten at leisure. On one occasion I had gathered a half dozen abalones and deposited them on top of a flat rock, intending to take them to camp later as an addition to my bill of fare. While less than thirty feet away, I heard a rustle of wings and looked up just in time to see a raven flying away with my dinner. The abalones had clung together and, though quite a load for the bird, he had not dropped any when last seen, flying into the woods.

Another interesting bird of the locality, also a shell-fish eater, is the Black Oystercatcher (*Haematopus bachmani*). This bird, one of the largest of our waders, occurs in suitable localities along our whole coast from Mexico to Bering Sea. Its black body and wings, flesh-colored feet and legs, bright red chisel-shaped bill, and loud whistling sail notes render it very conspicuous. It is known to the Alaskans as Red-billed Snipe and is frequently utilized for food. As far as I was able to ascertain, the oystercatcher subsists principally on limpets and the shells of these are often used as a lining for the nest, a cavity in the rocks, never far from the water's edge.

There are several species of our wild ducks that feed largely on shell fish. Among the most notable of these are the three Pacific Coast

scoters, or surf ducks (*Oidemia americana*, *O. deglandi* and *O. perspicillata*), and the Harlequin Duck (*Histrionicus histrionicus*). The scoters obtain the shell fish principally by diving in shallow water and they will eat nearly any kind of small mollusc, which they swallow entire, the shell as well as the meat being digested. The stomach of an adult male Surf Scoter (*O. perspicillata*) examined at Forrester Island contained 154 specimens of Margarita helicina and 893 specimens of Margarita laevior, besides other shells too far digested to be separated.

The Harlequin Duck feeds mostly in the surf where it breaks against the rocks. This bird, like the oystercatcher, seems to prefer small limpets as its food and obtains them mostly without diving, picking them from the rocks, at or near the water's edge. The stomach of one Harlequin Duck examined by the writer contained 164 small limpets, mostly *Acmaea persona*, but with a fair sprinkling of the young of *A. Patina* and *A. Pelta*.

The stomachs of a pair of Pintail Ducks (*Dafila acuta*) taken at Sitka were full of littorines (*Littorina sitchana*). The Pintail, however, is principally a vegetarian, probably eating few molluscs excepting during its migrations up and down the coast.

The common breeding gull of the locality (*Larus glaucescens*), though primarily a fish eater, often resorts to a diet of shell fish during a scarcity of its natural food. I have often observed these birds picking the soft parts from chitons and, in the vicinity of mud flats, they may be frequently seen extracting the meat from the shells of the large northern cockles (*Cardium corbis*) that have been left exposed by the outgoing tide.

A small pteropod (*Limacina pacifica*) is abundant at times during fine weather in some sections of southeastern Alaska. It swims through the water by means of two wing-like appendices and is eaten by gulls, grebes and other water birds, as well as by several species of fish.

GEORGE WILLETT.

STUDIES IN ZOOLOGY II.

Osteology—(The Skull)

Preceeding the bony skull of vertebrates there is its counterpart in membranous form and in this the material is deposited which forms the permanent bony box.

In all sharks and rays the skull does not advance beyond the cartilaginous stage though there is a greater or less deposition of lime salts giving the chondrocranium a varying degree of rigidity in the different species and in the different individuals of different ages of the same species.

The skull of a mammal may be said to include the cranium or brain box and with it the bones of the face; the lower jaw or mandible, the hyoid bone, styloid process and the bones of the middle ear.

The shark's skull is a loose, cartilaginous affair and is very valuable to us in affording a clue to the working out of the vertebrate idea. The shark possesses seven gill-arches and the first and second of these play an important part in the formation of the skull.

The first gill-arch divides in the middle and form what are known as the palato-quadrata and Meckel's cartilages. The former is homologous to the tooth-bearing bones of the upper jaw of mammals and the latter corresponds to the mandible or lower jaw of the higher vertebrates, with this difference that, in the lower forms, as sharks, Meckel's cartilage is the lower jaw and in the higher vertebrates it is the core or rod about which the bony material is deposited.

In these higher forms Meckel's cartilage disappears at an early time and is therefore not found in the adults. It is to be seen in such reptiles as the alligator.

A small part of Meckel's cartilage is constricted off at an early period in the embryo of mammals and becomes the anvil of the middle ear. The other two bones of the middle ear, the incus and the stapes, are derived from the second gill-arch which also forms the hyoid bone.

Upon or in the two jaws, the upper and lower, the teeth are formed and in both cases they are derived from the epidermis.

The teeth of all vertebrates are divided into two groups—homodont in which all are alike and cone-shap and heterodont—in which there are four kinds, incisors, canines, premolars and molars.

Farther than this we will not discuss teeth more than to say that they are very important as factors in classification.

As early as the Devonian age, there appeared peculiar, generalized fishes known as the Dipnoi, in which the swim-bladder began to be modified as an organ of respiration. Along with this comes a modification of the limb structure suggesting the legs of the amphibians. The heart also is modified in keeping wth the new method of respiration.

Probably in the Devonian, and certainly in the Carboniferous, there appeared great, armor-headed amphibians called stegocephals. These are the earliest amphibians of which we have any record.

In this animal we find the first of the middle-ear bones, the stapes (derived from the second gill-arch) and two occipital condyles, which is exceptional below mammals, which regularly possess two occipital condyles.

As the name would indicate the skull of these early amphibians was entirely covered by bony plates—that is, it was not open at the top as we see in so many other of the simple vertebrates. Cavities for the eyes and nostrils were present and also one for the pineal eye.

The quadrate bone which, in birds and reptiles is placed between

the mandible and the cranium, is, in these animals, firmly attached to the cranium.

From birds downward we find this bone showing all degrees of attachment to the cranium. The quadrate bone originates from the proximal end of Meckel's cartilage which, in turn had its origin from the first gill-arch. When it disappears, as it does in mammals, it becomes the anvil of the middle ear.

In frogs, toads and salamanders many interesting modifications occur which we cannot now discuss.

Primitive extinct reptiles show striking resemblance to the amphibians of their day, but in recent forms there is to be seen a more definite separation of the two groups. A further discussion of these variations would be out of place at this time because it would involve too much technicality. I would refer the reader to Zittel's Paleontology for a careful analysis of the transitional forms of the border-land between the reptiles and amphibians.

In their day the reptiles were dominant in the three elements—land, water and air—and their whole bony structure, including the skulls, were modified to meet the varying necessities. The mechanical problems involved in the structure of the volant reptiles is a most interesting study. For this I refer the reader to Seeley's little book "Dragons of the Air."

DR. F. C. CLARK.

SOME CALIFORNIA CHRISTMAS DECORATIONS

One of the most sought-after Christmas greens in Southern California is the Christmas Berry or so-called Christmas Holly (*Heteromeles arbutifolia* (Poir.) Roem.). The magnificent clusters of scarlet berries against the rich green of the leaves makes one of the finest contrasts in our flora. The plant is in no way related to the true Holly of the Eastern states, but belongs to the great Rose family. It gets its name of "Holly" from the berries rather than from the plant itself. It makes a very handsome plant in cultivation, the only drawback being that its much-sought berries offer a great attraction to trespassers. These berries are of a rather pleasant, acid-astringent taste and are eaten by the Indians with great relish. The Spanish Californians used them in the preparation of an agreeable drink.

One might get the effect of real Holly very easily by combining with the Christmas berry the foliage of the Oregon Grape (*Berberis dictyota* Jepson). This is a low shrub having compound spinescent leaves and blue-black berries. It is found on dry ridges in the San Gabriel mountains.

Of course, Christmas would hardly be Christmas without the Mistletoe, of which we have two species, *Phoradendron villosum* Nitt.

and *P. macrophyllum* (Engelm.) Cockerell. The first is parasitic chiefly on oaks of various species, and the second on sycamores and various soft wood trees. It gets its generic name from the Greek, the two words meaning literally "tree thief."

We also have some very ornamental and decorative ferns, chief of which are the wood or shield fern (*Dryopteris rigida arguta* Underw.), found on all our shady hillsides below 3500 feet altitude; the so-called "sword fern" (*Polystichum munitum* (Karlf. Underw.), found mostly above that altitude, and the large and handsome Woodwardia (*Woodwardia spinulosa* Mart. & Gale.), which brings its large clumps to their highest perfection in the moist canyon bottoms.

Among the Pine family perhaps the two offering the most attractive Christmas decorations are the Big-cone Spruce (*Pseudo-tsuga macrocarpa* (Torr.) Mayr.), and the large, flat sprays of the Incense Cedar (*Libocedrus decurrens* Torr.). These are both found in our near mountain ranges, mostly above 2000 feet.

GEO. L. MOXLEY.

WHY DID I JOIN THE LORQUIN NATURAL HISTORY CLUB?

When the Lorquin Natural History Club was brought to my attention, I attended a meeting, impelled by sheer curiosity. I left feeling more than pleased. The program was excellent— instructive without the bone dryness often met in scientific lectures, which intended to be technically accurate, are filled with a vocabulary unintelligible to the layman. Subsequent experience, before and after joining, has left this first impression unaltered.

After the meeting I met some of the members and was surprised to find men and women, young and old, interested in every branch of science, mingling to exchange ideas and experiences, thus broadening their conceptions of their own studies, at the same time learning that the worth-while existed in other lines of research. Humanity unconsciously follows the path of least resistance, and scientists more than any other class are prone to wear a rut and slip along in it. These varied lectures and the informal discussions do much to broaden those who will take advantage of their opportunities.

Hardly second to these was the hearty welcome extended by all, and the wholesome desire to make the newcomer feel at home even though he be a stranger within the gates. All too many of our scientific workers become case hardened in their unflagging search for truth, and leave the humanities to care for themselves. It is a tendency handed down as a heritage by those zealous pioneers who sought for

the Elixir of Youth, and vainly tried to transmute the baser elements into glistening gold.

The section meetings in certain lines do much to help those who want to devote more time to their own hobbies than the scheme of the general meetings can permit. Here again we find excellent speakers who know their subjects, and are willing to give of the largess they have accumulated.

The third opportunity provided for expansion is both mental and physical. I refer to the field trips. Routed to the salt water or the mountains, these are a never-ending source of benefit of which more of our members should avail themselves. The leader is chosen because of his or her knowledge of the country to be traversed, and ample opportunity is offered to those who wish to collect that which appeals to them. Then there is the camp at noon for a bite of lunch, and, if the length of the trip permits, the true California siesta. The country around Los Angeles is all of interest to the lover of Nature and the Red Gods, whether they go intent on enriching their individual collections or merely to get away from the smoke and worry and fret of humdrum existence, to absorb the ozone and health so bountifully given by One who knows our needs better than the wisest of us. Those who avail themselves not can blame no one else. Give Nature a chance and ailments, mental or physical, will yield to her simple treatments. I know of no finer way to go to her than with a group of sympathetic companions, each of whom can contribute his quota to the enjoyment of true recreation.

Why did I join the Lorquin Natural History Club? Because I had a hobby, to develop which I must give and receive ideas. Because I knew the only true way to enlarge my hobby was to study related hobbies in which others were interested. Last but not least, because I have an unshakable belief that every one needs a definite amount of wholesome relaxation, and I know of no better, more certain or safer place to secure it than in the company of congenial companions in Nature's playground.

RICHARD G. DAVIS.

BUTTERFLIES OF ELYSIAN PARK

During the spring I have taken a number of varied forms of butterflies in Elysian Park.

Colias eurytheme, male; antennae brown, tipped with black; fore wings yellow, with a slight wash of orange on the lower half; an orange spot in the limbal area of each wing; apex and outer margin light black; hind wings yellow with an orange spot in the limbal area of each; outer margin pale black.

Female: Fore wings white, a small black spot on each in limbal

area; apex and outer margin very narrow and pale brown; hind wings white with a yellow spot in the limbal area; outer margin pale brown and very faint on the lower half of the wing; antennae pink, tipped with brown.

Junonia caenia, male: Antennae brown; just under the large eye-spot in the limbal area of each wing is a second and smaller spot.

This spring has been very good for *Melitaea*. My brother took one specimen of *Melitaea quino*, which is rather rare in the park. We booth took a large number of *Melitaea gabbi*.

HERMAN KLOTZ,

LIBRARY NOTES

Mr. May reports that little use is being made of the club library. This is not as it should be in view of the many good things that are in it.

The November Bulletin of the Missouri Botanical Gardens has an excellent article about the poinsettia and its cultivation; also one on smoke damage to plants.

Our entomological students will be interested in the synopsis of the coleopterous family of Cisidae (Ciodae) of America north of Mexico, by Chas. Dury. This was published in the Journal of the Cincinnati Society of Natural History, November, 1917, and is now in the Club library.

ANNOUNCEMENTS

The regular meetings of the Lorquin Natural History Club are held in the Lecture Room of the Los Angeles Public Library at 7:45 p. m. on the first Tuesday evening of each month. The first Tuesday of January, 1918, being a holiday, however, the meeting will be postponed to Thursday, January 3rd. Mr. Newell will give a talk on the Sierra Nevada Mountains. Everyone interested is invited to attend these meetings.

January 19-20. Mt. Wilson Observatory. Leave the Main street Pacific Electric station at 1:58 p. m., Oak Knoll car, Saturday, January 19th. Transfer to North Lake avenue car at Lake and Colorado streets. Ride to end of line and walk to foot of toll road. Distance to Mt. Wilson, nine miles. Saturday evening and Sunday spent at Observatory, viewing telescopes, etc. Return Sunday. Carfare 35 cents, toll 25 cents, lodging at hotel \$1.00, meals 75 cents each. If any prefer to carry lunch, hot coffee or sandwiches can be bought at the gate house at hotel. This will be the big field trip of the winter and a good time is assured all, besides the opportunity to see the innside of the Observatory. For members only. Led by Richard Davis.

Future Club trips will be announced at the meetings or information can be obtained from the Secretary, Geo. Malcolm, 6015 York Boulevard, Garvanza 121, or from Mr. Percival Chase, 2631 Kenwood Avenue, Home 75150.

Owing to the H. C. of L. and possibly to other causes unknown to the Publication Committee the Club is not obtaining sufficient funds to warrant the continuation of Lorquinia as a monthly paper. The editor still has several papers worth publishing and more in prospect, and it is hoped to publish other numbers of Lorquinia as circumstances will permit. In the meantime manuscript received will be typed and placed in the Club Library. Our suspension is partly due to failure to obtain advertisements to carry part of the cost of the paper, and if any of our readers can help us with suggestions or good substantial advertising contracts we shall be pleased to hear from them.

E. P. CHACE, Editor.
STEWART TOWNE,
E. E. HADLEY,
Publication Committee.

Any one who received an imperfect copy of No. 3, Vol. II of Lorquinia may obtain a good one by notifying the editor.

A communication has been received from our former President, Mr. Paul Ruthling, who is traveling in Mexico at present. He wishes the Club much success and all its members a very merry Christmas.

FOR SALE, WANTS AND EXCHANGES

FOR SALE—A limited number of Volume I (complete) of LORQUINIA may be had at \$1.50 per volume. To members of the Club, \$1.00. Send cash with order to LORQUINIA, 2202 West 10th St., Los Angeles, Cal.

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AN UNREPORTED EXPOSURE OF THE SAN PEDRO PLEISTOCENE

E. P. and E. M. Chace

Sixteen years ago, when Dr. Ralph Arnold published his work on the Paleontology and Stratigraphy of the Marine Pliocene and Pleistocene of San Pedro, California, he made the remark that "we have in the California deposits the greatest development of the marine Pleistocene in the world." Some of the exposures on which he based this statement have since been obliterated by improvements in and around San Pedro, but others that were apparently unknown to him are still being reported. Among the latter is one to which we have given the name, "The Chiton Bed, Pt. Firmin."

It is situated a few yards west of the western boundary of the picnic grounds around Peck's Pavilion, and hardly more than ten feet below the upper edge of the bluff. Directly below the rather sandy topsoil a thin layer of red-brown sandstone is exposed, then comes the fossil-bearing stratum: a gray sand, in some places so hard as to offer considerable resistance to the caseknife, in others weathered to a loose, trickly deposit. Immediately below this is another layer of the red-brown previously seen. Owing to the conformation of the bluff I am unable to say what lies beneath the second red layer. There are numerous small stones in the fossiliferous layer, some of them apparently chalcedony, others our common white quartz, still others are fragments of a dark shale. These stones have probably prevented a previous report of this exposure, as at a little distance the shells are thoroughly masked by these bits of rock. It is an odd fact that although the gray sandstone layer continues, apparently unchanged, both to the east and west of the ten-foot section in which we have worked, we were unable to find any shells except in that small space.

We have visited the exposure three times, and from the material collected have identified the following species, with two exceptions: *Williamia vernalis*, *Amphissa variegata*, which Dr. Dall of the U. S. National Museum has kindly identified for us, and the chitons, which

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have been determined by Dr. S. S. Berry and will be more fully discussed by him in his forthcoming paper:

PELECYPODA

<i>Cardita subquadrata</i> , Cpr. com.	<i>Pecten latiauritus</i> , Conr. frag.
<i>Cumingia lamellosa</i> , Sby. 2 spec.	<i>Phacoides Californica</i> , Conr.
<i>Modiolus modiolus</i> , Lam. frag.	<i>Septifer bifurcatus</i> , Rue. 1 spec.
<i>Paphia staminea</i> , Conr. 2 frag.	<i>Transenella tantilla</i> , Gld. 6 spec.

GASTEROPODA

<i>Acmaea asmi</i> , Midd. 6 spec.: <i>incessa</i> , Hds. few. <i>limatula</i> , Cpr. many. <i>mitra</i> , Esch. 1 spec. <i>pelta</i> , Esch. many. <i>persona</i> , Esch. 1 spec. <i>scabra</i> , Gld. many.	<i>Fusus monksae</i> , Dall. 1 spec. jun. <i>Gadinea reticulata</i> , Sby. 3 spec. <i>Haliotis cracherodii</i> , Leach, 1 spe. <i>rufescens</i> , Swains, v spec. <i>Hipponyx antiquatus</i> , Cpr. many. <i>tumens</i> , Cpr. 2 spec.
<i>Alectriion fossata</i> , Gld. 2 spec.: <i>mendica</i> , Gld. and var. <i>cooperi</i> , Fbs. many. <i>perpinguis</i> , Gld. many.	<i>Leptothyra carpenteri</i> , Pils. 7 spe. <i>Littorina scutulata</i> , Gld. many. <i>planaxis</i> , Nutt. few.
<i>Acanthina lapilloides</i> , Cpr. many	<i>Olivella biplicata</i> , Sby. 3 spec.
<i>Amphissa variegata</i> , Dall. 3 frag.	<i>Macrochasma crenulata</i> , Sby. 2 jun.
<i>Bittium</i> , several specimens belonging to at least two species, not yet determined.	<i>Marginella jewettii</i> , Cpr. 1 spec.
<i>Calliostoma suprngranosum</i> , Cpr. 2 spec.	<i>Megatebennus bimaculatus</i> , Dall. 3 spec.
<i>Columbella</i> , sp. ? 4 spec.	<i>Murex barbarensis</i> , Gabb, 1 frag.
<i>Crepidula aculeata</i> , Gmel. many. <i>adunca</i> , Sby. many. <i>crepidula</i> , Lam. 1 spec. <i>f. exuvia</i> , Nutt. 1 spec. <i>dorsata</i> , Brod. 4 small spec.	<i>Scalaria</i> sp. ? 1 spec.
<i>Drillia torosa</i> , Cpr. 2 spec.	<i>Tegula funebrale</i> , A. Ad. many. <i>brunnea</i> , Phil. 2 spec.
<i>Fissurella volcano</i> , Rue. many.	<i>Tornatina eximia</i> , Baird, 1 spec.

POLYPLACOPHORA

<i>Callistochiton crassicostatus</i> , Pils. —1 valve, 1 fragment. <i>decoratus</i> , Cpr. —1 valve. <i>Chaetopleura gemma</i> , Cpr. —1 valve. <i>Cyanoplax hartwegii</i> , Cpr. —5 valves.	<i>Mopalia ciliata</i> , Sby. —3 valves, 3 fragments. <i>lignosa</i> , Gld. —1 fragment. <i>muscosa</i> , Gld. <i>Nuttallina cf. fluxa</i> , Cpr. —2 valves, 13 fragments. —40 valves and fragments.
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<i>Ischnochiton cooperi</i> , Cpr.	<i>Placiphorella velata</i> , Cpr.
—2 fragments.	—1 fragment.
<i>magdalenensis</i> , Hds.	<i>Tonicella lineata</i> , Wood.
—9 valves, 12 fragments.	—1 valve.

The outstanding features of this list of shells are (1st) its somewhat contradictory stratigraphic evidence, (2nd) its richness in chitons, and (3rd) its limitations, or should we say its purity?

In Dr. Arnold's book to which we have already referred, he divides the Pleistocene deposits of San Pedro and vicinity into two groups, which he calls the Upper and Lower San Pedro series. This latter is a gray sandstone, usually quite hard, and we have found no reference to any such deposit as Upper San Pedro series. On the other hand, of the twelve species of the above list which Arnold found in only one stratum, one belongs to the Pliocene, even older than the Lower San Pedro, four to the Lower San Pedro itself, and seven to the Upper San Pedro. Of the nineteen species which we have taken and which are not recorded by Arnold, practically all are still living here, although more common in the north. It is sincerely to be hoped that some of our Southern California geologists will take an early opportunity to seek decisive evidence of the age of this particular deposit.

The next point of interest, in fact the thing which first impresses the collector, is the large number of chiton valves which this deposit yields. Dr. Arnold obtained three valves in the course of his years of work. Mr. Oldroyd reports a single valve (*Ischnochiton conspicuus*) from that rich pocket of Pleistocene shells at Los Cerritos. Dr. Clark has obtained something over 200 specimens from his long and vigorous work above Santa Monica, but having had the pleasure of sorting over some of his material, we have no hesitation in saying that they do not represent nearly so large a proportion of the shells handled as do the ninety valves and identifiable fragments which we have taken from this exposure.

Closely associated with the large number of chiton valves is the unusual homogeneity of this list. It contains just three strictly sand-dwelling species: *Tornatina eximia* and the two *Alectriionidae*, while a list of equal length from Santa Barbara included twelve. This purity combines with the small extent to suggest a possible origin for the deposit. We can easily imagine a small tide-pool near the low-water line of a rocky coast. In and close around it lived these fifty-odd species, as most of them are found today, until these strangers were ushered in by a heavy storm. Is it too great a strain to picture this as occurring at the beginning of the period of shallow water conditions which filled the little pool with the gray sand, and then sealed it with the red which still lies above it?

LORQUINIA REORGANIZATION

At the regular business meeting of the Club, held at the home of Percival Chase Dec. 13th, a committee was appointed to arrange for affiliation with the Southwest Museum, making certain necessary changes in the Constitution, with power to act. The committee, consisting of Percival Chase, President; Stuart S. Towne, Secretary; E. P. Chace, Treasurer; Dr. Comstock, representing the Southwest Museum; Enrico Piazza, H. M. Simms, and Geo. L. Moxley, met on Monday evening, Dec. 16th, and adopted an almost entirely new Constitution and ratified the affiliation with the Museum. This action will give the Club much larger privileges and greater scope in its activities. The management of Club affairs is delegated to an Executive Council, consisting of the officers of the Club, the Director of the Southwest Museum, the Editor of Lorquinia and the chairmen of the various sections that may be formed. Membership is open to anyone interested in any phase of Natural History. No membership fee is charged, but a General Activities Fund is maintained by the voluntary contribution of \$1.50 per year, which entitles the contributing members to access to the Club Library and Collections. It is expected that each member will take up some congenial line of study and report progress at least semi-annually. Plans are being made for the issue of Lorquinia at least quarterly. Altogether we feel that the Club is now on a permanent and safe basis.

PRELIMINARY NOTICES OF SOME NEW WEST AMERICAN CHITONS

By S. S. Berry, Redlands, California

Publication of the papers originally intended to contain them having been unexpectedly delayed, the following very brief notices of certain undescribed chitons are published herewith, in order that the names involved may be used without having to wait for the more full descriptions forthcoming in the publications referred to.

Advance publication of species from the dredgings of the United States Bureau of Fisheries Steamer "Albatross" is made possible by kind permission of the Commissioner of Fisheries:

Xiphiozona, new subgenus.

Lepidopleurids of simple structure and sculpture; the dorsal girdle armature composed of minute, spine-like scales, among which are scattered numerous isolated longer spines, some of which are gathered into compact groups in the angles of the sutures.

Type: the following species.

Lepidopleurus (Xiphiozona) heathi, new species

Shell small, strongly convex. Anterior valve with 100 or more radial series of flattened grains. Median valves similarly sculptured, the lateral area not raised and poorly defined. Tail valve with mucro much elevated and almost overhanging posteriorly, its slope strongly concave. Sutural laminae triangular. Girdle covered with minute, short, pointed spinelets, with larger scattered spines among them, particularly near the sutures as noted above. Color of shell a warm yellowish brown, copiously mottled slaty gray.

Type Locality: Fifteen fathoms, off Monterey, California (Dr. H. Heath).

Cyanoplax fackenthallae new species

Chiton of moderate size, best described in few words by comparison with *C. lowei* (Pilsbry), which it resembles very closely, but is apparently somewhat larger; light brown in color; has the eaves lower, very much more finely porous, and (especially on valve i) more decidedly projecting; has less pronounced sculpture, though of similar nature to that of *C. lowei*, and the head valve less crenulate; interior pure white instead of tinted; tail valve with fewer (10 instead of about 13), blunter, and coarser teeth; all valves have much less porous sinus and lines leading into the slits.

Type locality: Pacific Grove, California (Mrs. C. S. Fackenthall).

Mopalia egretta new species

Closely allied to *M. sinuata*, but with the side slopes arcuate, lateral areas distinctly raised, sutures strongly dentate, and with the major girdle setae sutural in position, long, erect, and branching into numerous nearly straight, slender, needle-like aciculae. Color brownish red with maroon and buff mottlings.

Type Locality: Twenty fathoms, Forrester Island, Alaska (G. Willett).

Mopalia cirrata new species

Shell of moderate size, oval, with slightly arcuate side slopes. Head valve with eight strong, somewhat tuberculous radial ribs and weaker sutural ribs, the interstices checkered by pits and squarish grains like basket work. Median valves with strong diagonal ribs; sutural ribs more or less obsolete; the areas between with even, basket-like sculpture; central areas on each side with some twenty arcuate, granulos riblets, strongly converging toward the jugum, and conspicuously latticed by a somewhat weaker system of curved transverse riblets; a narrow tract along the jugum smooth. Tail valve small, with a slightly elevated mucro and narrow, abrupt caudal sinus. Color of shell a soiled buff with brown suffusion and mottling. Girdle moderately wide, minutely scaled above and bearing an inner sutural series of ex-

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tremely long, slender setae, furnished with slender branching aciculae; series of minor setae near the margin.

Type Locality: Sta. 4263, Dundas Bay, Alaska ("Albatross").

Mopalia phorminx new species

Small, elongate, with straight side slopes. Surface finely granulose. Head valve with ten major radiating series of coarse pointed pustules, one or two similar but smaller series interposed in alternation. Median valves with lateral areas bounded by rib-like diagonal and sutural series of coarse pustules, and with some 2-5 minor series of pustules interpolated between. Central areas on each side with 10-14 sharp, flexuose, longitudinal ribs, the outer ribs more or less broken posteriorly, the breaks forming radial series of granules in front of the diagonal rib. Tail valve with mucro strongly posterior, little elevated; caudal sinus strong. Sliit formula 8, 1-1, 1-1. Girdle narrow, armed above with a microscopic spinulation, and both a major sutural and several minor series of beard-like setae. Color brownish cream, with yellowish brown mottlings.

Type Locality: Off Point Pinos, California (Dr. Heath).

Mopalia chacei new species

Moderately small, oval, with distinctly arcuate side slopes. Head valve with ten clear-cut, heavy, pustulose ribs, their interstices heavily granulose. Median valves with strong diagonal and weaker sutural ribs, both pustulose, the lateral areas coarsely granulose between them; central areas on each side with 18-20 clear-cut, slightly granulose, longitudinal ribs, generally straight, but on jugum becoming finer and converging in front, interstices latticed by a system of numerous very fine transverse riblets. Tail valve small, with depressed mucro and shallow posterior sinus. Color of shell dull greenish brown, more or less mottled with various tones of brown or green. Girdle narrow for a Mopalia, bearing a primary sutural series of short setae, spinose on the upper margin, and 2 or 3 gradually smaller series of similar setae outside of these.

Type Locality: La Jolla, California (S. S. Berry).

Placiphorella pacifica new species

Shell obovate, depressed. Anterior valve with 12-14 low, radiating ribs. Central areas of median valves nearly smooth; lateral areas raised, ornameted with 2 low, weakly nodulose ribs. Tail valve small, with subterminal mucro. Head valve with 16 slits, median valves with 1-1 slits, tail valve slitless. Girdle narrow behind; expanding into a broad lobe in front; covered dorsally by minute, microscopic spinelets and occasional slender spinose setae and tufts of spines.

Type Locality: Sta. 4245, 95-98 fathoms, Kasaan Bay, Alaska ("Albatross").

Ischnochiton (Lepidozona) asthenes new species

Shell small, carinate, with convex side slopes. Surface granulose. Head valve with 11-12 low, rounded flutings, bearing 2-4 minute pustules each. Median valves with lateral areas distinctly raised, bicostate, each rib bearing 2-5 small pustules; central areas with 15-18 narrow, granulose, longitudinal ribs, finely interlatticed between, but becoming obsolete on jugum. Slit formula 9, 1-1, 12. Girdle scales small, convex, delicately ribbed. Color of shell yellowish brown, mottled deeper.

Type Locality: White's Point, Los Angeles County, California.
(A. G. Smith.)

Ischnochiton (Lepidozona) golischii new species.

Shell small, strongly carinate, side slopes faintly arcuate. Surface minutely granulose. Head valve with about 45 nearly obsolete ribs, weakly grooved between, each bearing 5-7 extremely minute distant granules. Median valves with lateral areas distinctly raised, each with 4-5 almost obsolete, minutely distantly granose ribs; central areas on each side with about 20 granulose longitudinal ripples, finer and closer toward the jugum, their interstices granulose but scarcely latticed. Tail valve with perhaps 30 indistinct radiating ribs on the posterior tract. Dorsal girdle scales finely distinctly striate. Color of shell warm brownish rosy.

Type Locality: 100 fathoms, off Santa Monica, California (W. H. Golisch).

LEPIDOPTERA

AN ACCOUNT OF A COLLECTING TRIP IN THE HIGH SIERRA

By Chas. L. Fox

During the summer of 1915 from July 19th to August 6th I collected in that more elevated portion of the Sierra Nevada Mountains to which the name "High Sierra" was applied by the geologists of the California Survey, making the camp of the Sierra Club in the Tuolumne Meadows my headquarters.

I started on foot up the Zig-zag trail from Mirror Lake in the Yosemite Valley; that wonderful gorge whose sides are sheer precipices, rising at this point 3000 feet or more from the floor of the valley to the summit. It was a hard pull up over this trail, but one was rewarded the higher one ascended by the grandeur of the view. I had my collecting net ready for whatever I might find on the way, but was so occupied by the steepness of the ascent and by the weight of my knapsack that few specimens were taken. However, three weeks later, when returning down this same trail, I captured several specimens

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of *Habrodais grunus* Bd., then new to my collection, on the canyon live oak (*Quercus chrysolepis*), at an elevation of 5000 feet.

The distance from the Tuolumne Meadows to Yosemite Valley is 21 miles, rising from an elevation of 4000 to 8500 feet at the former. Half way between these places is Tenaya Lake, where I stayed over night at a small camp of the Sierra Club.

Next day, on reaching Tuolumne Meadows, the site of an ancient glacier and lying along the Tuolumne River at an elevation of 8500 feet, I found *Surymus behri* Edw. very abundant, flying over the fine grass and flowers and very easy to capture, which rather surprised me, as I had read different accounts on the habits of this alpine butterfly stating that it was occasionally found near the summit and was difficult to take, owing to the rugged nature of its haunts. I might add that during this trip I found it only in the meadows at different altitudes and never on summits or on rough places.

I also made the acquaintance for the first time of *Heodes cupreus* Edw. as it perched feeding on the flowers of the yellow groundsell (*Senecio lugens*), its small lustrous red wings glistening in the sun. I afterward found this species plentiful on the mountain sides from 8500 to 12,500 feet.

During the first few days of my stay I worked the Tuolumne Meadows and the lower hillsides adjacent, taking, besides the species above mentioned, *Pieris occidentalis* Reak., *Argynnis montivaga* Behr, *Brenthis epithore* Bd., *Euphydryas sierra* Wright, *Poecilias gracilis* G. and R., *Phyciodes campestris* Behr, *Phyciodes mylitta* Edw. *Plebeius saepiolus* Bd. race *aehaja* Behr.

This high mountain form with heavy spots in both sexes on the underside and with broad dark borders on the upper side in the males was originally described by Dr. Behr from the Tuolumne Meadows.

Plebeius shasta Edw.

This small Blue, in search of which I had the summer before climbed the steep sides of Mt. Shasta in Siskiyou County, but without success, I found frequenting dry, gravelly hillsides, flying around a small prostrate form of blue lupine.

Plebeius aquilo Bd. race *podarce* Feld.

This small alpine race was by far the most abundant Lycaenid on the meadows.

Plebeius icarioides Bd.

This widely distributed and variable butterfly I took on the purple bush lupine, growing in the sunny openings in the pine forest.

Of the Hesperiidae taken I identify *Thorybes mexicanus* H. and S. race *nevada* Scud.

Both Holland and Wright figure this black-brown skipper as *aemilea* Skin. Wright's specimen was taken in the Sierra Nevada Mountains.

Polites sabuleti Bd. race *tecumseh* Grin.

This little mountain race of *Sabuleti* described by Fordyce Grinnell Jr. (Ent. News, Jan. 1903) of which Wright's *Chispa* is a synonym, was very abundant all over the meadows.

From the Sierra Club camp at Soda Springs looking towards the west is seen the Hoffman Range; to the south the Cathedral group consisting of Cathedral (11,000 feet), Unicorn (10,800 feet) and Johnson (10,000 feet) Peaks; towards the southeast rises that fragment of tableland speared by the general erosion known as Kuna Crest, of which Mammoth Peak is the highest point (12,225 feet); while due east tower the massive red twin mountains of Dana and Gibbs, 13,000 feet high or more.

Towards the end of July I began to explore these higher altitudes, and about this time I noticed that *Euryimus behri* Edw. had almost disappeared from the Tuolumme Meadows but begun to fly on the high glacial meadows from 9,000 to 10,000 feet elevation, having an appearance as if just emerged. I was therefore enabled to obtain a further large series of perfect specimens.

Heodes mariposa Reak

Heodes editha Mead

About this date I also began to find these two species of Chrysopaninae around the bluish-purple asters (*Aster canescens*) in the meadows and sunny openings amongst the lodge pole pines (*Pinus contorta var. murryana*) at altitudes of not higher than 9,000 feet.

On the twenty-seventh of July I joined a party of Sierra Club members for an ascent of Mt. Dana at the foot of which we camped for the night. Next morning, getting out of sleeping bags at day break, we found a heavy frost covering the ground, and after a hearty breakfast started up the trail through the pine forest following the Dana Creek. Reaching timberline we encountered a strong icy wind and found the streams frozen solid in many places. Such conditions did not look promising for collecting. After a strenuous scramble over huge granite rocks up the southern side of the mountain we at last gained the top and stood on the verge of the great precipice that forms the eastern face of the mountain and also the left-hand wall of Glacier Canyon. Directly beneath us at the head of this canyon was the small Dana Glacier, a remnant of the vast snowfield which formerly enveloped the entire High Sierra. From the summit on which we stood, 13050 feet and above the sea, only exceeded in altitude by Mt. Lyell, 13090 feet and Mt. Ritter, 13156 feet, which rise with dazzling whiteness toward the south, there spread out before us a panorama of the High Sierra, peak after peak in almost endless succession as far as the eye could reach, the snowbanks near their summits glistening in the sun, whilst at varying elevations could be seen the deep blue of small glacial lakes and still ower down the dark sombre forests of pine.

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Looking towards the east, nearly the entire Mono Basin was in view and far below lay Mono Lake, silent and motionless with the Five Craters near its shore.

Descending the mountain on the opposite side to the one I ascended, in spite of the bitter wind I captured specimens of the small *Euphydryas nubigena* Behr, originally described by Dr. Behr, from the Tuolumne Meadows region, also *Pieris sisymbrii* Bdv. flying amongst the small alpine flowers that flourished in every crevice and hollow, including the light purple penstemon (*Penstemon mensiesii* var. *davidsonii*), the minute white alpine buckwheat (*Eriogonum ovalifolium*) and its yellow relative (*Eriogonum incanum*), also the small yellow Draba with its tiny mat-like leaves and flowers, and the alpine white moss phlox (*Phlox caespitosa* sub-sp. *muscoides*).

Hearing from a botanist friend of the profusion of flowers growing on Mt. Hoffman, I explored the mountain, finding the beauty of the flowers there fully up to my expectations. At the base of the mountain I took the large Blue, *Plebeius anna* Edw., distinguished from *melissa* Edw. by the much lighter orange-colored sub-marginal band on the underside. On nearing the summit I came upon typical *Philotes battooides* Behr. This dark little Lycaenid, characterized by the heavy quadrate black spots on the underside, inhabits the higher elevations from 10,000 feet and upwards. A race of this species from Southern California, named by Barnes and McDunnough *bernardino*, is paler in ground color and has much smaller and lighter markings on the underside.

On the 3rd of August, a few days before returning to San Francisco, I decided to try my luck on Mammoth Peak (12225 feet), that part of Kuna Crest at the foot of which flow the Dana and Lyell forks of the Tuolumne River.

After walking over the trail leading towards Mono Pass for two hours, I left it and started "cross country" through the pine forest, guided by a sight now and then of the mountain top towering above me. It was an ideal day for collecting; warm and without a breath of wind, which is rather unusual in the high altitudes of the Sierra. No sooner had I reached the timberline and emerged into the open among the granite rocks and deformed, dwarfed pines than I saw large numbers of the pale ashen brown *Oeneis chryxus* race *ivallda* Mead chasing one another and alighting on the rocks and gravel. When at rest with wings folded, so closely do they resemble the color of the ground that at times it is difficult to distinguish them. Having secured a large series of these butterflies, I continued to climb higher, taking near the top *Euphydryas nubigena* Behr, *Pieris sisymbrii* Bd., *Philotes battooides* Behr and *Heodes cupreus* Edw.

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In conclusion let me advise any readers of these notes who might be planning a trip into the Tuolumne region to arm themselves with a collecting permit so as to avoid the experience I had of being "held up" by a ranger who to my surprise asked to see my permit for collecting butterflies. Before the permission was given me by verbal message from the Superintendent of the Yosemite National Park with the extraordinary proviso that no rare specimens were ever to be taken, it required some ingenuity on my part dodging rangers while out collecting.

Mr. Hal Newcomb of Pasadena has been exhibiting in the Los Angeles Public Library, a beautiful collection of rare butterflies from foreign lands, which has been the object of great interest to all those who have been on the seventh floor of the library recently. Included in this wonderful collection are found such rare species as *Morpho thiosa* from Central America and *Papilio homerus* which is to be found only in Jamaica and the island of Haiti. This is the only example of *Papilio homerus* in the West and is probably the most perfect specimen in existence. For brilliant coloration, *Urania Ripheus* from Madagascar, possibly excels any other insect in the world.

There have been many additions to our Club Library recently among which may well be noted the following:

The Aviator and the Weather Bureau.

The Climate and Weather of San Diego.

These two volumes by Mr. Ford A. Carpenter, meteorologist, were presented to the Club Library by the author and are worthy of special mention. Our somewhat distant member, in miles but not in spirit, Mr. Fordyce Grinnell, Jr. who is now located in Honolulu, Hawaii, favored the Club with a number of Hawaiian magazines which contain many excellent articles of general interest.

Space will not permit further remarks in this connection or reference to our regular publications being received daily but the librarian wishes to remind the members of the excellent material now available in our library for study. The library will continue to be housed at the residence of Percival Chase, 2631 Kenwood Ave., Los Angeles, until our new quarters in the Southwest Museum Building are made ready for occupancy.

In view of building up our collection of photographs, a standing offer has been presented to the Club members by Percival Chase, to

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furnish photographic prints from negatives of appropriate subjects, free to members who desire to exhibit same in album.

Those members who have not yet had photographs of themselves placed in the album and who would like to have this done, are requested to deliver such photos to the librarian in order that we may have pictures of every member.

PERSONALS

Chester Collins, an associate member who was prominent on our field trips is a Lieutenant of Artillery at Fort Travis, Texas.

Reginald Olds has returned to his home, having received his discharge after 18 months' service in the U. S. Navy.

Stanley F. Patton is a Sergeant in the Medical Dept., Fort McArthur, San Diego, Cal.

Allyn G. Smith is now Lieut. A. G. Smith of the Air Service and when last heard from was at Fort Sill, Okla.

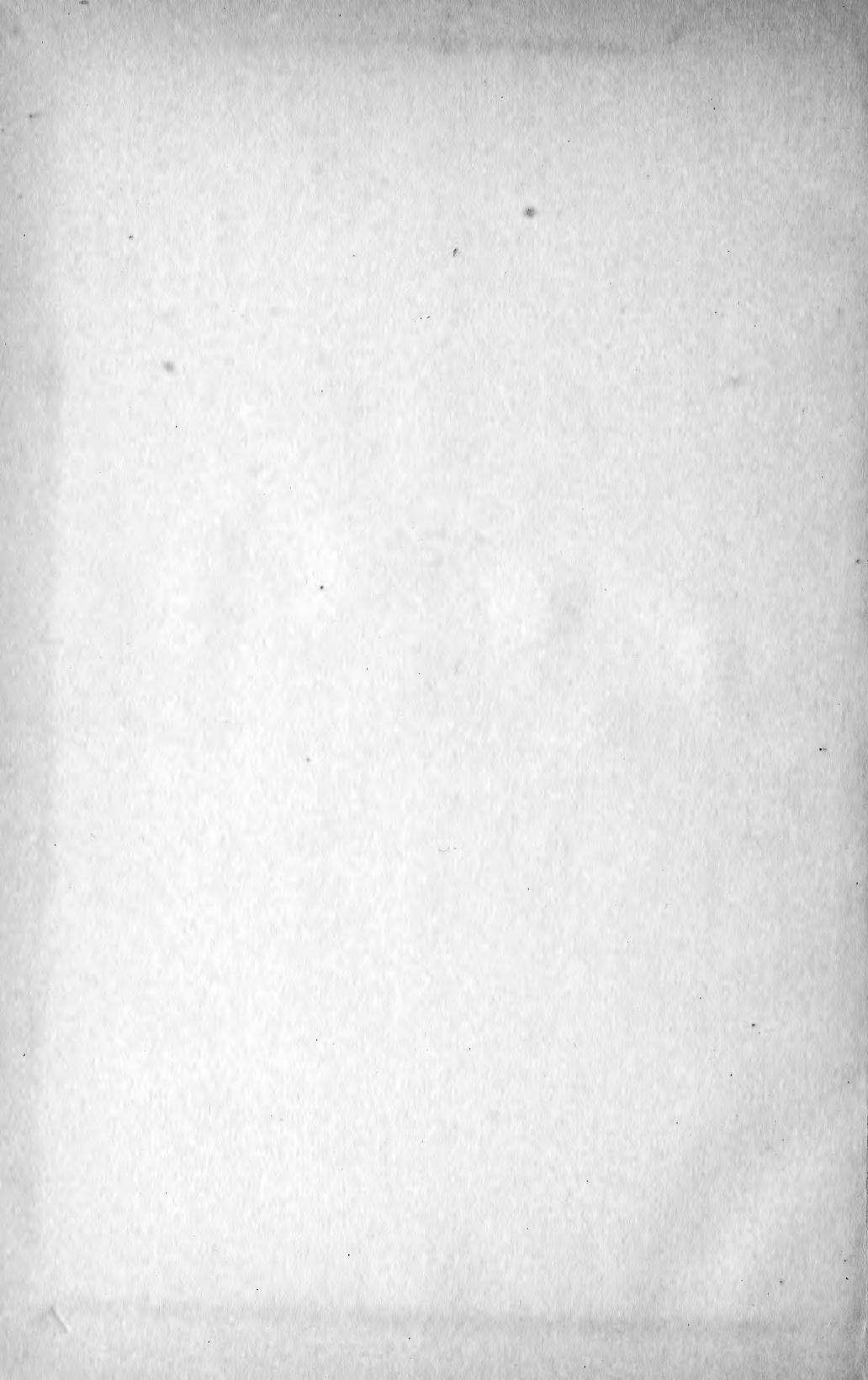
Mr. Grinnell, the first secretary of the Club is teaching in Honolulu.

Geologist Hadley has returned to the simple life and is at present farming somewhere in Iowa.

Paul Ruthling who served as the first editor of Lorquinia is now in Mexico where he is connected with the Mexican National Museum.







Mr. E. C. LaRue, an expert on Natural Water Resources will give an illustrated talk on the Utilization of Water Powers at the next regular meeting which will be held Thursday evening Jan. 3rd. As the Lecture room of the Public Library is rather small ~~for~~ in which to shew Mr. LaRue's fine set of slides the committee has arranged to hold the meeting at the Unitarian Church, 925 So. Flower St.

Don't forget the time and place and bring your friends.

The monthly Directors meeting will be held at the home of ~~XXXXXX~~ Stuart S. Towne, 910 Ave. 65. Arriandale Car to Elder St. or York Blvd. Car to York Blvd. & Pasadena Ave. and walk east to Ave 65.

Friday evening Jan. 11^a 1918.

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